1. Important Safety Notice

● Providing appropriate service and repair is a matter of great importance in the serviceman's safety maintenance and safe operation, function and performance which the SUBARU vehicle possesses.

● In case the replacement of parts or replenishment of consumables is required, genuine SUBARU parts whose parts numbers are designated or their equivalents must be utilized.

● It must be made well known that the safety of the serviceman and the safe operation of the vehicle would be jeopardized if he used any service parts, consumables, special tools and work procedure manuals which are not approved or designated by SUBARU.

2. How to Use this Manual

● This Service Manual is divided into four volumes by section so that it can be used with ease at work. Refer to the Table of Contents, select and use the necessary section.

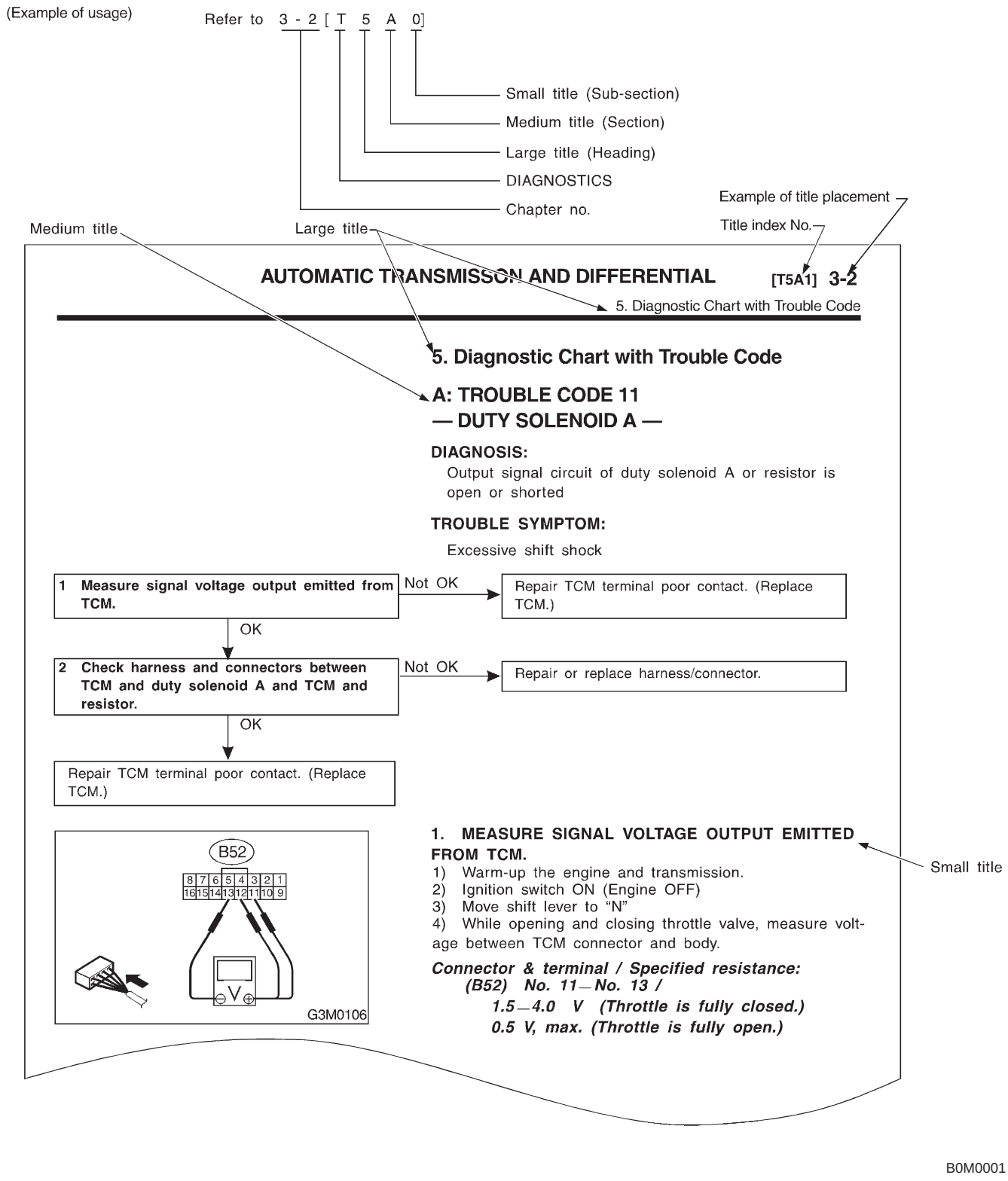
- GENERAL INFORMATION SECTION
- REPAIR SECTION
- DIAGNOSTICS SECTION
- WIRING DIAGRAM SECTION

● The description of each area is provided with four types of titles different in size as shown below. The Title No. or Symbol prefixes each title in order that the construction of the article and the flow of explanation can be easily understood.

[Example of each title]

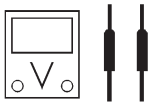
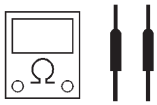
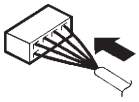
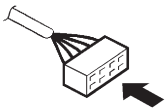
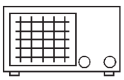
● Area title:	T. DIAGNOSTICS
● Large title (Heading):	1. Diagnostics Chart with Select Monitor (to denote the main item of explanation.)
● Medium title (Section):	A: BASIC DIAGNOSTICS CHART (to denote the type of work in principle.)
● Small title (Sub-section):	1. CHECK INPUT SIGNAL FOR ECM (to denote a derivative item of explanation.)

● The Title Index No. is indicated on the top left (or right) side of the page as the book is opened. This is useful for retrieving the necessary portion.



B0M0001

- In this manual, the following symbols are used.

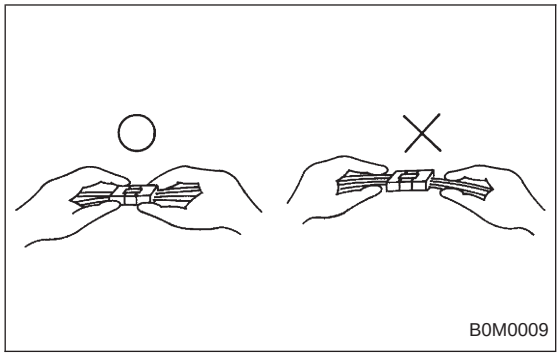
Character	Description
 B0M0002	Circuit tester ● Voltage measurement
 B0M0003	Circuit tester ● Resistance measurement
 B0M0004	The arrow indicates that insertion of the probe or numbering of the connector pins is made from the side.
 B0M0005	The arrow indicates that insertion of the probe or numbering of the connector pins is made from the side.
 B0M0006	Oscilloscope
B0M0007	Oscilloscope positive probe
B0M0008	Oscilloscope earth head

- **WARNING**, **CAUTION**, NOTE

  - **WARNING:** Indicates the item which must be observed precisely during performance of maintenance services in order to avoid injury to the mechanics and other persons.

  - **CAUTION:** Indicates that item which must be followed precisely during performance of maintenance services so as to avoid damage and breakage to the vehicle and its parts and components.

  - NOTE: Indicates the hints, knacks, etc. which make the maintenance job easier.

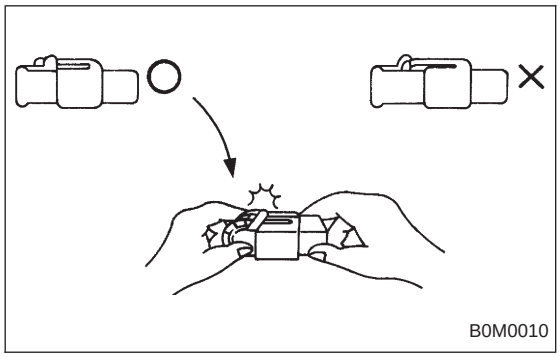

B0M0009

3. Basic Checks

A: DISCONNECTING CONNECTORS

● Always hold the connector itself.

CAUTION:
Don't pull the harness.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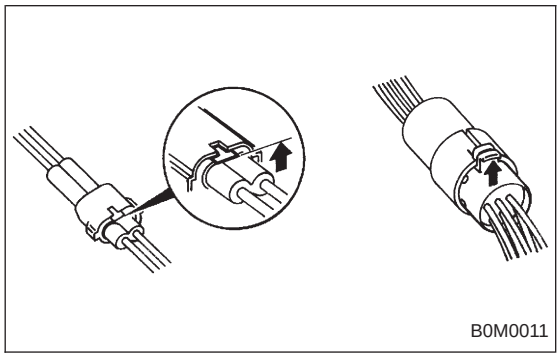
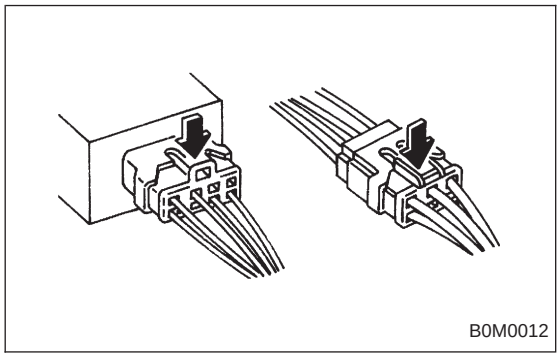
● Inspect a connector by pushing it all the way in. If the connector is equipped with a locking device, push it in until a clicking sound is heard.

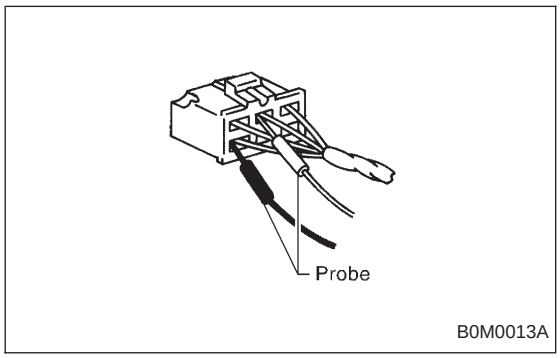

B0M0011

● To disconnect a locking connector, first release the lock, then pull the connector off.
<Unlock by pulling the locking tab.>


B0M0012

<Unlock by pushing the locking tab.>

B: INSERTING A PROBE



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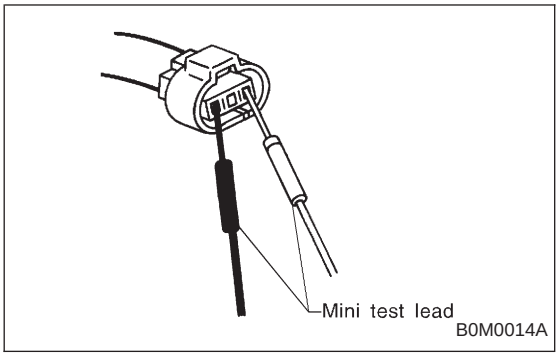
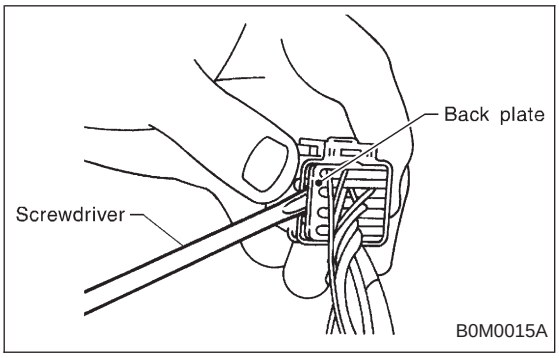
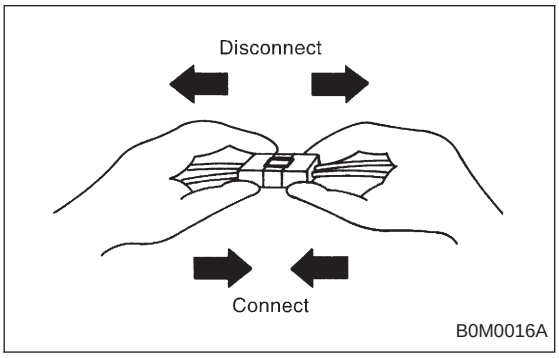
● Generally, probes are inserted into connectors from the rear side (wire side).
● When removing the shock protector take care not to deform it; this also applies to waterproof connectors, which cannot be tested from the wire side.



● Connectors equipped with shock protectors must be checked with a mini probe (thin), or it will be necessary to remove the shock protector.



● When the connector has a back plate, remove the plate after removing the projection of the plate first. (Be careful not to use excessive force, since the terminals might brake off.)



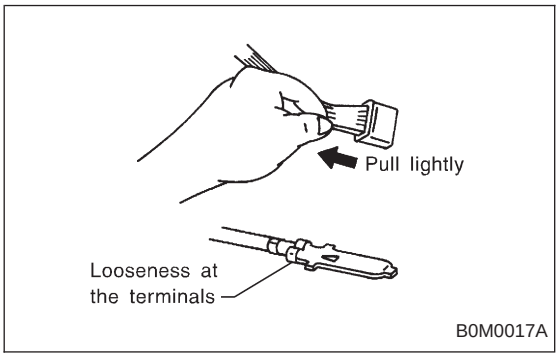
C: CHECKING FOR POOR CONTACT ON PLUG-IN CONNECTORS

1. POOR CONTACT

Poor contact is frequently caused by corroded terminals, dirt, foreign substances, weak contact points between male and female connectors, etc. Quite often a plug with poor contact will work perfectly again after it has been pulled off and reconnected. If harness and connector checks do not reveal any defect, it can be assumed that an intermittent contact in a connector is the source of trouble.

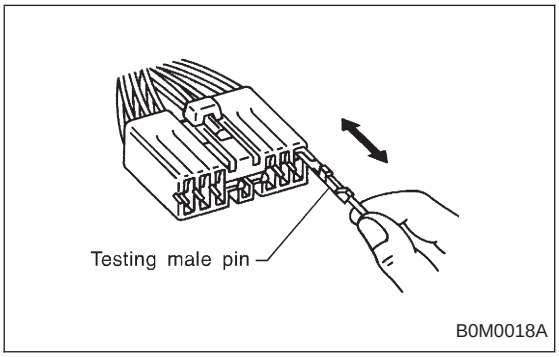
2. VISUAL INSPECTION

1) Disconnect the two connector halves.
2) Check the connector pins for signs of corrosion or foreign material.
3) Check the connector for loose and damaged terminals, and make sure they are set correctly in the connector.

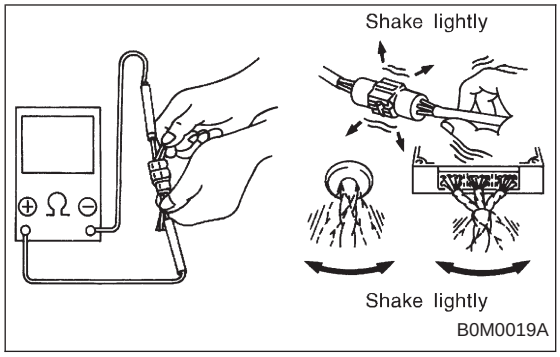


NOTE:
When the harness is pulled lightly, the terminals should not come out.

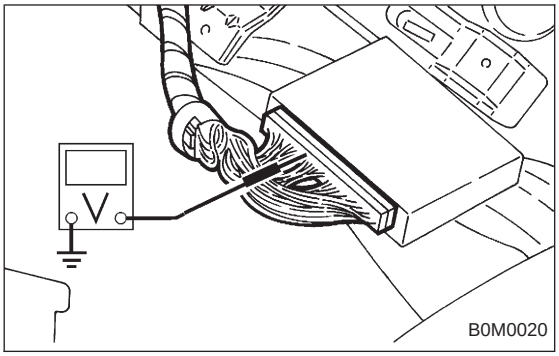
4) Insert the male pin of the connector into the female pin, then pull it out.

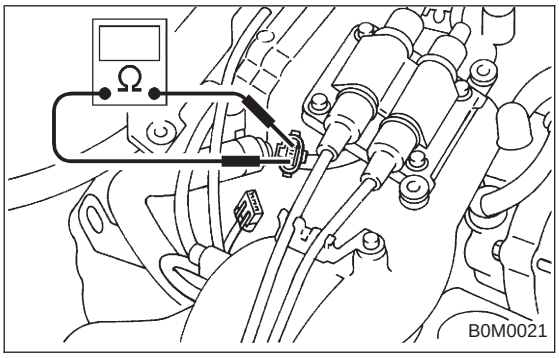


NOTE:
If one of the pins allows to pull out easily, it is a likely source of a malfunction.



5) Shake lightly the connector and the harness, and check for sudden changes in voltage or resistance.





4. Diagnosis and Checking Procedure Using Instruments

A: USING A CIRCUIT TESTER

1. VOLTAGE CHECK (range set to DC V)

Connect the positive probe to the terminal to be tested, and the negative probe to body ground. (or the ground terminal of the ECM)

2. CHECKING THE CONNECTION (range set to Ω)

Measure the resistance and check for open or shorted wire in the harness or the connector.

NOTE:
This check must be carried out with both connectors disconnected.
(This avoids by-passing the connection through other circuits.)

1) Check for open circuit. (range: Ω x 1K)
Measure the resistance between the respective pins in both connectors.

Specified resistance:
More than 1 MΩ (No continuity) Open circuit
Less than 10 Ω (Continuity) O.K.

2) Check for correct insulation value. (range: Ω x 1K)
Measure the resistance between the pins in both connectors, as well as between the suspected pin and the body. (body short)

Specified resistance:
More than 1 MΩ (No continuity) O.K.
Less than 10 Ω (Continuity) Short circuit

3) Resistance measurement (range set to Ω)
Measuring the internal resistance of sensors, solenoid valves etc. to check the operating condition of components.

NOTE:
● Select the appropriate range for measuring the internal resistance, or the measurement will result in an incorrect reading.
● Before changing the measurement range the gauge must be reset to zero.

B: USING A SUBARU SELECT MONITOR

With this testing procedure the defective component can be determined by directly monitoring input/output signals of the ECM or the trouble codes.

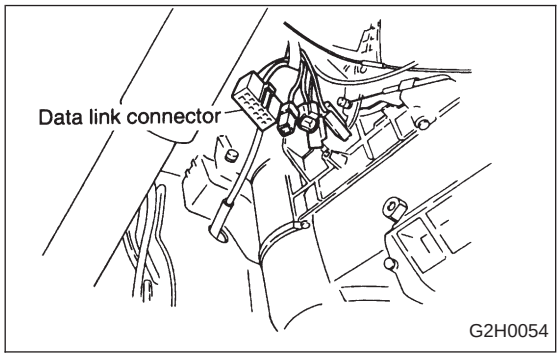
1. FEATURES

● A variety of data can be checked without movements from the drivers seat, passenger's seat or from outside the vehicle.
● This unit allows the identification of the type of malfunction, for example whether the cause is an open or shorted wire in the input/output signal line, or whether the breakdown of a component is caused by a lack of maintenance.

2. DIAGNOSIS

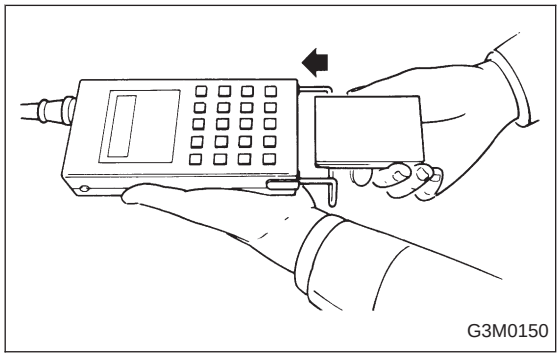
● Refer to the reference values for input/output and control data to determine whether the malfunction is caused by a worn out component, an open wire, a short etc.
● Perform the diagnostics procedure as described in chapter "Check based on trouble codes" by monitoring the trouble codes.

NOTE:
It will be easier to determine a malfunction if the vehicle data for normal conditions are available for comparison.

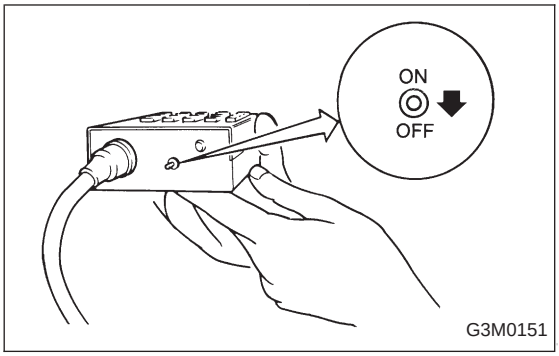


3. CONNECT SELECT MONITOR.

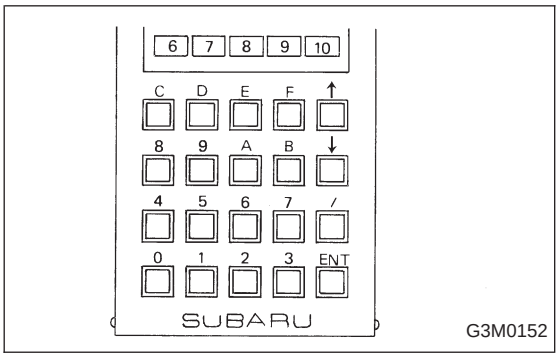
1) Connect select monitor to data link connector located under instrument panel. (on driver's side)



2) Insert cartridge into select monitor.

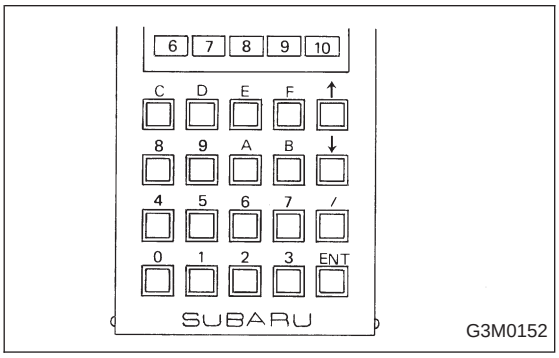


3) Turn ignition switch and select monitor switch ON.
4) After display is shown, press slash "/" key.
5) After AT mode is displayed, press function "[0]".
(Display returns to AT mode when slash "/" is pressed during on-board diagnostic operation.)



4. READ TROUBLE CODE SHOWN ON DISPLAY.

1) Connect select monitor.
2) Designate mode using function key.
Press [F] [B] [0] [ENT] in that order.
3) Ensure trouble code(s) is shown.



5. PREVIOUS TROUBLE CODE READING

1) Connect select monitor.
2) Designate mode using function key.
Press [F] [B] [1] [ENT] in that order.
3) Ensure displayed trouble code(s).

C: USING AN OSCILLOSCOPE

A malfunction can be determined by displaying the waveforms of input/output signals on the oscilloscope.

1. DIAGNOSIS

A simple comparison of the waveforms may lead to an incorrect diagnosis. To exactly determine the sources of the malfunction it will be necessary to determine them under consideration about information other than waveforms.

2. APPLYING INPUT/OUTPUT SIGNALS

Connect the probe directly with the terminal of the signal.

1. General

1. GENERAL DESCRIPTION

● The on-board diagnostics (OBD) system detects and indicates a fault in various inputs and outputs of the complex electronic control. CHECK ENGINE malfunction indicator lamp (MIL) in the combination meter indicates occurrence of a fault or trouble.
● Further, against such a failure or sensors as may disable the drive, the fail-safe function is provided to ensure the minimal driveability.
● The OBD system incorporated with the vehicles within this engine family complies with Section 1968.1, California Code of Regulations (OBD-II regulation). The OBD system monitors the components and the system malfunction listed in Engine Section which affects on emissions.
● When the system decides that a malfunction occurs, MIL illuminates. At the same time of the MIL illumination or blinking, a diagnostic trouble code (DTC) and a freeze frame engine conditions are stored into on-board computer.
● The OBD system stores freeze frame engine condition data (engine load, engine coolant temperature, fuel trim, engine speed and vehicle speed, etc.) into on-board computer when it detects a malfunction first.
● If the OBD system detects the various malfunctions including the fault of fuel trim or misfire, the OBD system first stores freeze frame engine conditions about the fuel trim or misfire.
● When the malfunction does not occur again for three consecutive driving cycles, MIL is turned off, but DTC remains at on-board computer.
● The OBD-II system is capable of communication with a general scan tool (OBD-II general scan tool) formed by ISO 9141 CARB.
● The OBD-II diagnostics procedure is different from the usual diagnostics procedure. When troubleshooting OBD-II vehicles, connect Subaru select monitor or the OBD-II general scan tool to the vehicle.

A: ENGINE

1. ENGINE AND EMISSION CONTROL SYSTEM

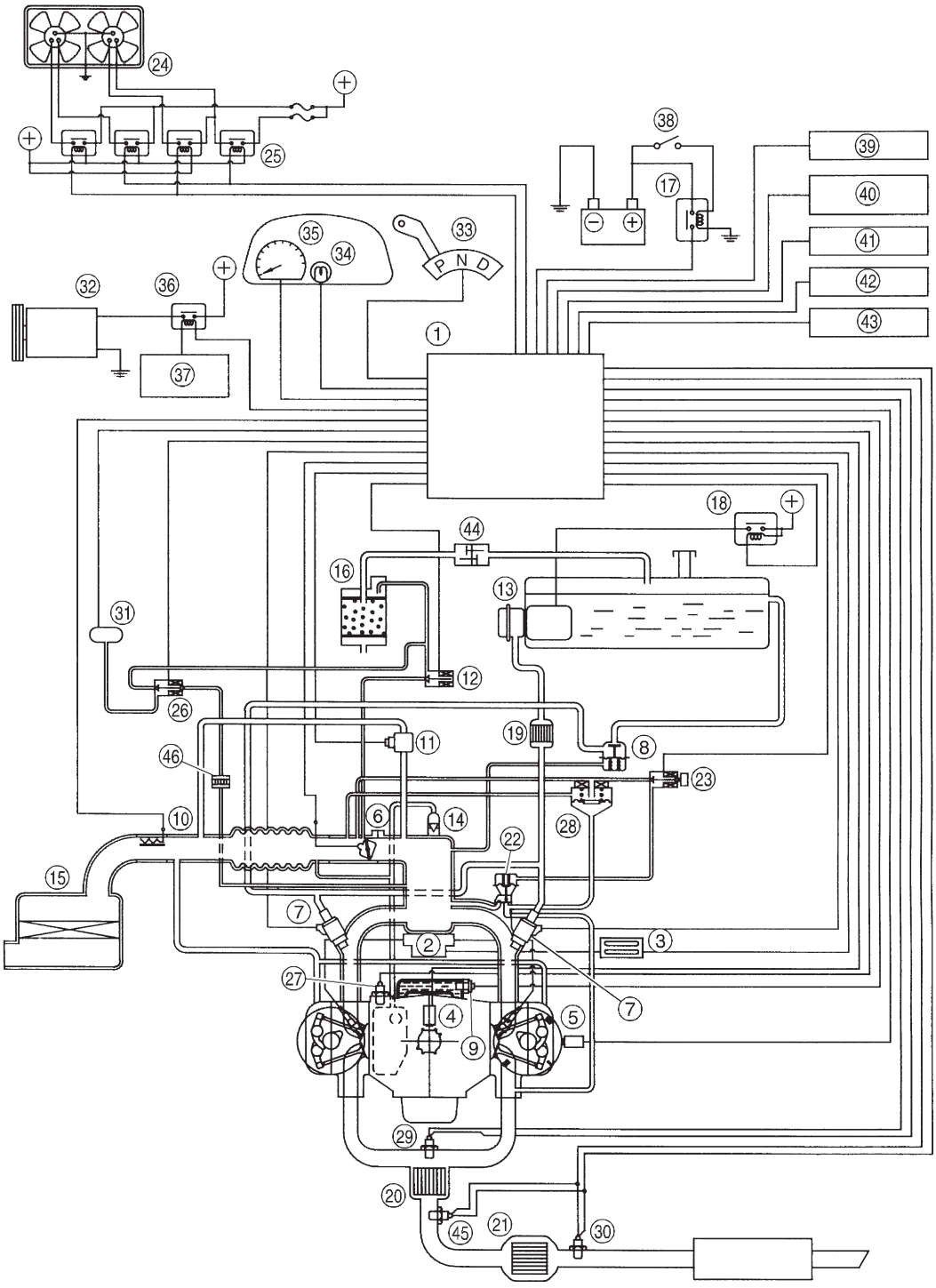
● The Multipoint Fuel Injection (MFI) system is a system that supplies the optimum air-fuel mixture to the engine for all the various operating conditions through the use of the latest electronic technology.
With this system fuel, which is pressurized at a constant pressure, is injected into the intake air passage of the cylinder head. The injection quantity of fuel is controlled by an intermittent injection system where the electro-magnetic injection valve (fuel injector) opens only for a short period of time, depending on the quantity of air required for one cycle of operation. In actual operation, the injection quan-

tity is determined by the duration of an electric pulse applied to the fuel injector and this permits simple, yet highly precise metering of the fuel.

● Further, all the operating conditions of the engine are converted into electric signals, and this results in additional features of the system, such as large improved adaptability, easier addition of compensating element, etc. The MFI system also has the following features:

1) Reduced emission of harmful exhaust gases.
2) Reduced in fuel consumption.
3) Increased engine output.
4) Superior acceleration and deceleration.
5) Superior startability and warm-up performance in cold weather since compensation is made for coolant and intake air temperature.

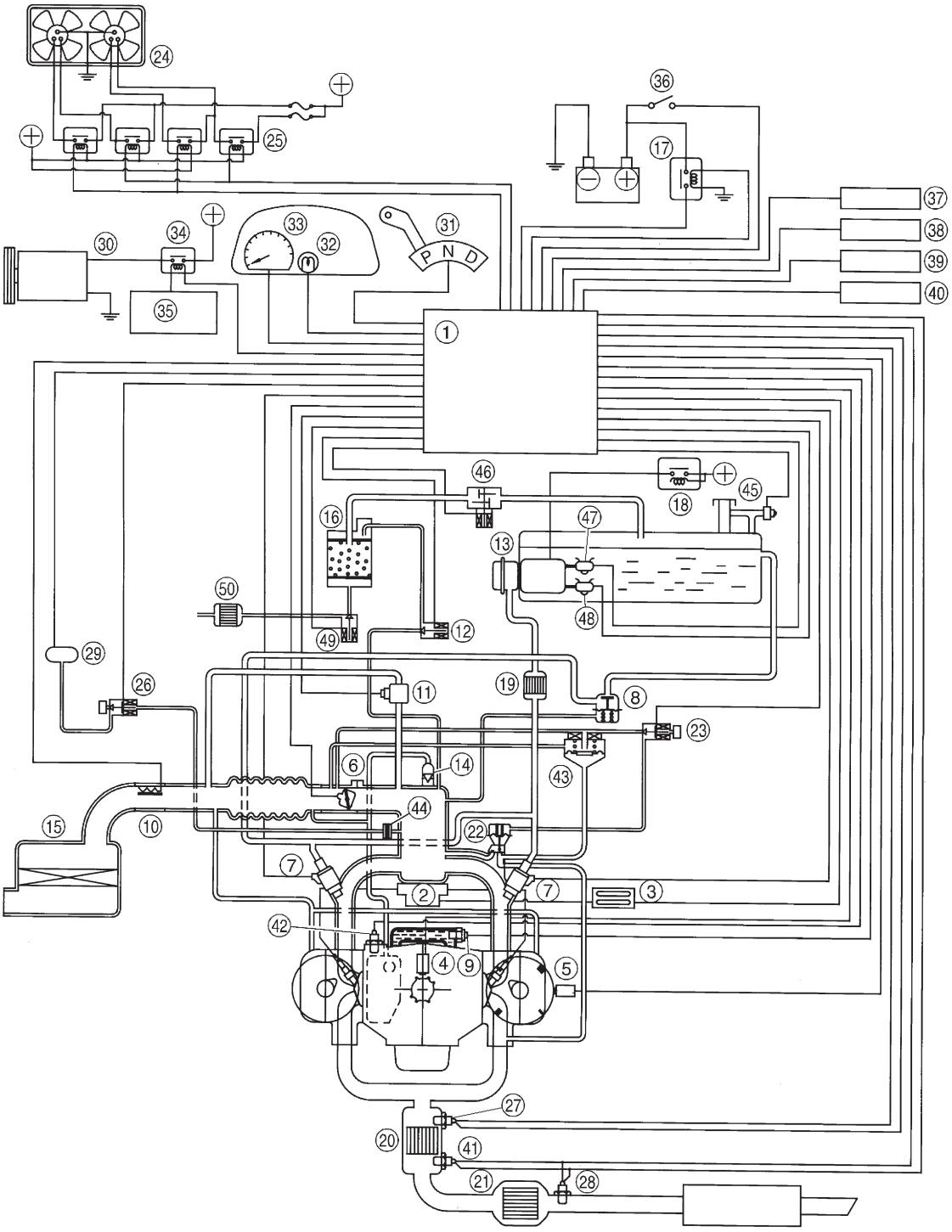
2. SCHEMATIC (2200 cc FWD AND TAIWAN SPEC. VEHICLES)



B2M0709A

① Engine control module (ECM)
② Ignition coil
③ Ignitor
④ Crankshaft position sensor
⑤ Camshaft position sensor
⑥ Throttle position sensor
⑦ Fuel injectors
⑧ Pressure regulator
⑨ Engine coolant temperature sensor
⑩ Mass air flow sensor
⑪ Idle air control solenoid valve
⑫ Purge control solenoid valve
⑬ Fuel pump
⑭ PCV valve
⑮ Air cleaner
⑯ Canister
⑰ Main relay
⑱ Fuel pump relay
⑲ Fuel filter
⑳ Front catalytic converter
㉑ Rear catalytic converter
㉒ EGR valve (AT vehicles only)
㉓ EGR control solenoid valve (AT vehicles only)
㉔ Radiator fan
㉕ Radiator fan relay
㉖ Pressure sources switching solenoid valve
㉗ Knock sensor
㉘ Back-pressure transducer (AT vehicles only)
㉙ Front oxygen sensor
㉚ Rear oxygen sensor (2200 cc Federal spec. vehicles)
㉛ Pressure sensor
㉜ A/C compressor
㉝ Inhibitor switch
㉞ CHECK ENGINE malfunction indicator lamp (MIL)
㉟ Tachometer
㊱ A/C relay
㊲ A/C control module
㊳ Ignition switch
㊴ Transmission control module (TCM) (AT vehicles only)
㊵ ABS/TCS control module (TCS equipped models)
㊶ Vehicle speed sensor
㊷ Data link connector (For Subaru select monitor)
㊸ Data link connector (For Subaru select monitor and OBD-II general scan tool)
㊹ Two way valve
㊺ Rear oxygen sensor (2200 cc California spec. vehicles)
㊻ Filter

3. SCHEMATIC (2200 cc AWD EXCEPT TAIWAN SPEC. VEHICLES)



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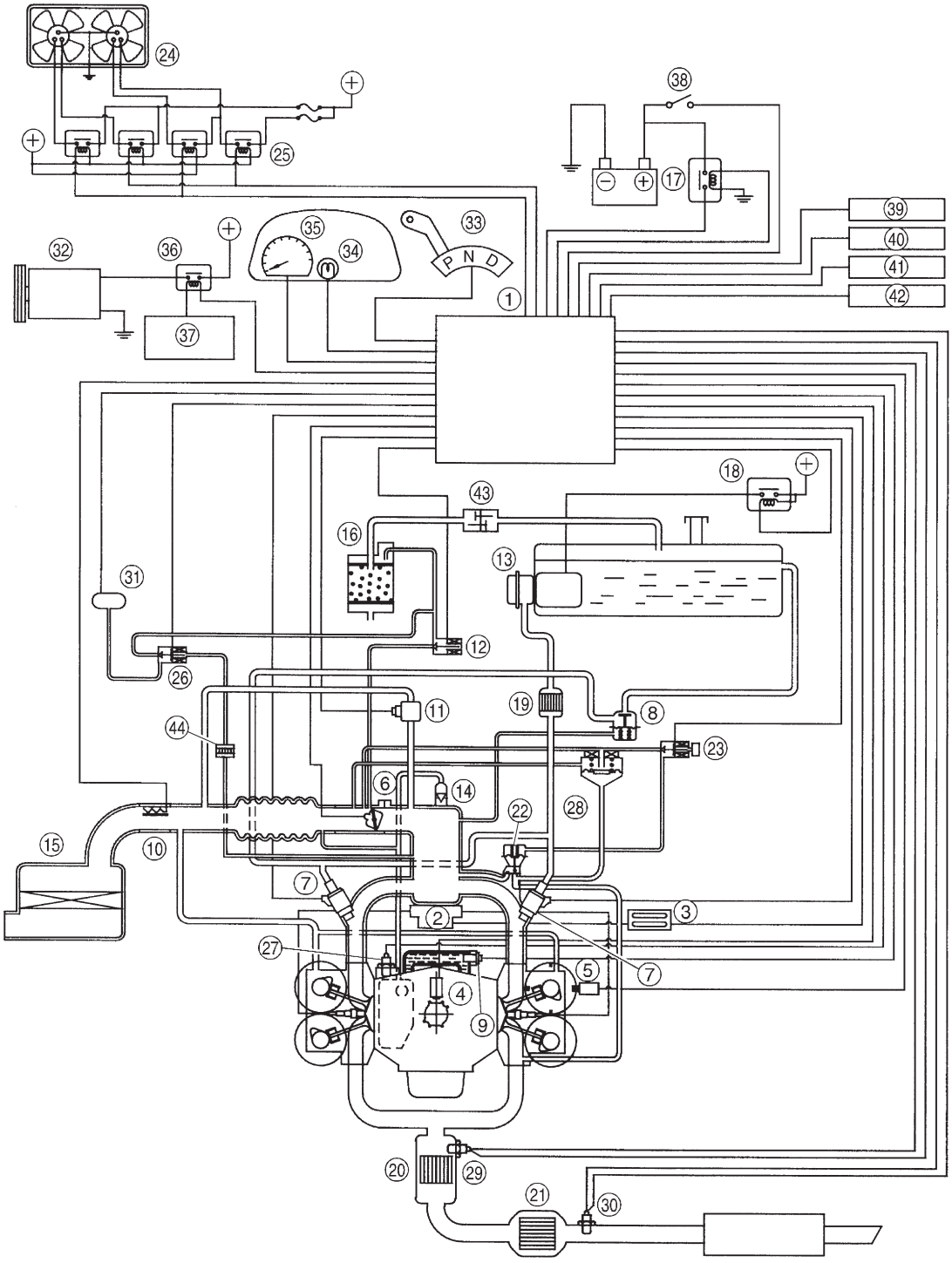
① Engine control module (ECM)
② Ignition coil
③ Ignitor
④ Crankshaft position sensor
⑤ Camshaft position sensor
⑥ Throttle position sensor
⑦ Fuel injectors
⑧ Pressure regulator
⑨ Engine coolant temperature sensor
⑩ Mass air flow sensor
⑪ Idle air control solenoid valve
⑫ Purge control solenoid valve
⑬ Fuel pump
⑭ PCV valve
⑮ Air cleaner
⑯ Canister
⑰ Main relay
⑱ Fuel pump relay
⑲ Fuel filter
⑳ Front catalytic converter
㉑ Rear catalytic converter
㉒ EGR valve (AT vehicles only)
㉓ EGR control solenoid valve (AT vehicles only)
㉔ Radiator fan
㉕ Radiator fan relay
㉖ Pressure sources switching solenoid valve
㉗ Front oxygen sensor
㉘ Rear oxygen sensor (2200 cc Federal spec. vehicles)
㉙ Pressure sensor
㉚ A/C compressor (With A/C models)
㉛ Inhibitor switch
㉜ CHECK ENGINE malfunction indicator lamp (MIL)
㉝ Tachometer
㉞ A/C relay (With A/C models)
㉟ A/C control module (With A/C models)
㊱ Ignition switch
㊲ Transmission control module (TCM)
㊳ Vehicle speed sensor
㊴ Data link connector (For Subaru select monitor)
㊵ Data link connector (For Subaru select monitor and OBD-II general scan tool)
㊶ Rear oxygen sensor (2200 cc California spec. vehicles)
㊷ Knock sensor
㊸ Back-pressure transducer (AT vehicles only)
㊹ Filter
㊺ Fuel tank pressure sensor
㊻ Pressure control solenoid valve
㊼ Fuel temperature sensor
㊽ Fuel level sensor
㊾ Vent control solenoid valve
㊿ Air filter

4. SCHEMATIC (2500 cc MODEL)



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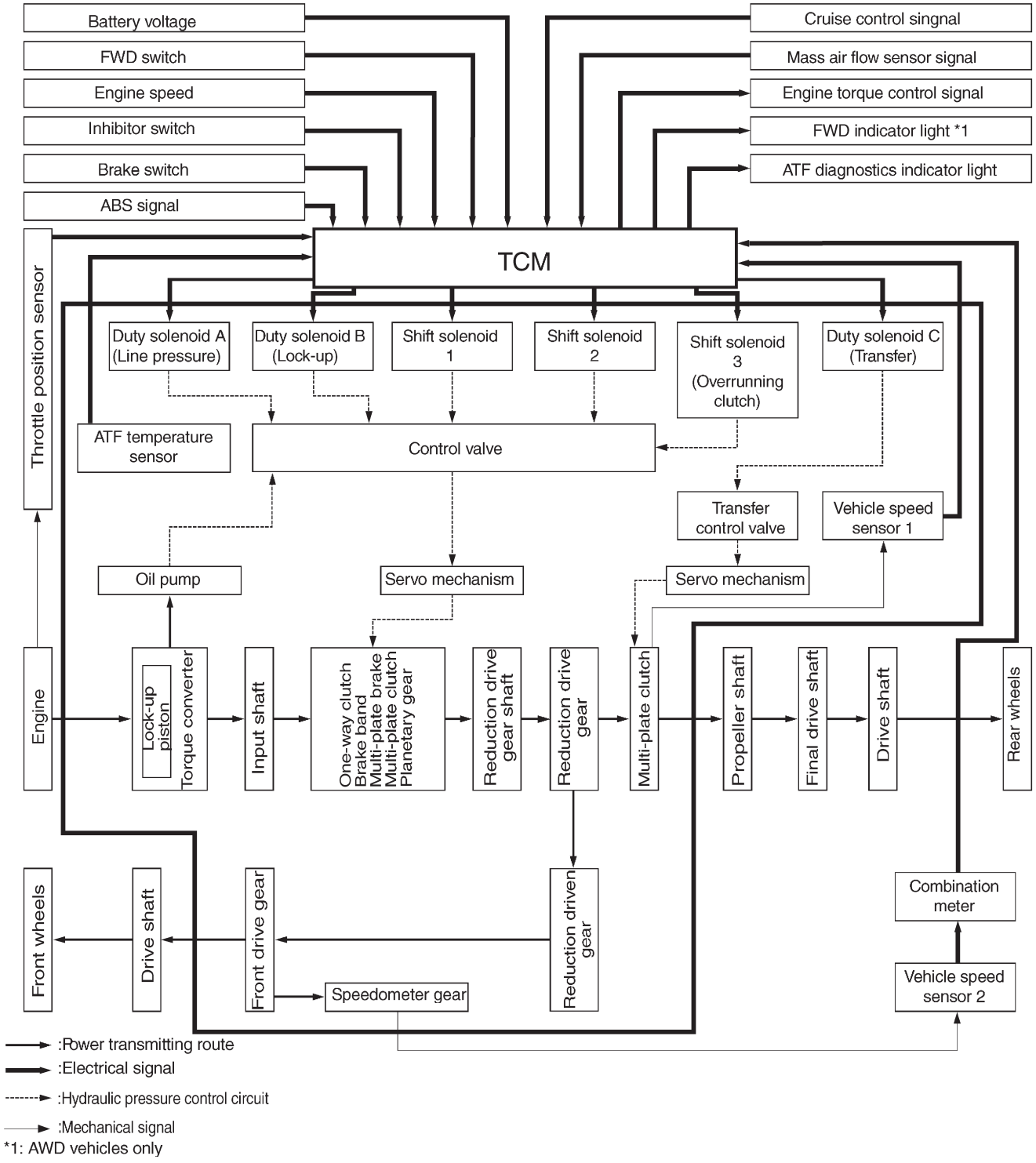
① Engine control module (ECM)
② Ignition coil
③ Ignitor
④ Crankshaft position sensor
⑤ Camshaft position sensor
⑥ Throttle position sensor
⑦ Fuel injectors
⑧ Pressure regulator
⑨ Engine coolant temperature sensor
⑩ Mass air flow sensor
⑪ Idle air control solenoid valve
⑫ Purge control solenoid valve
⑬ Fuel pump
⑭ PCV valve
⑮ Air cleaner
⑯ Canister
⑰ Main relay
⑱ Fuel pump relay
⑲ Fuel filter
⑳ Front catalytic converter
㉑ Rear catalytic converter
㉒ EGR valve
㉓ EGR control solenoid valve
㉔ Radiator fan
㉕ Radiator fan relay
㉖ Pressure sources switching solenoid valve
㉗ Knock sensor
㉘ Back-pressure transducer
㉙ Front oxygen sensor
㉚ Rear oxygen sensor
㉛ Pressure sensor
㉜ A/C compressor
㉝ Inhibitor switch
㉞ CHECK ENGINE malfunction indicator lamp (MIL)
㉟ Tachometer
㊱ A/C relay
㊲ A/C control module
㊳ Ignition switch
㊴ Transmission control module (TCM)
㊵ Vehicle speed sensor
㊶ Data link connector (Subaru select monitor)
㊷ Data link connector (OBD-II general scan tool)
㊸ Two way valve
㊹ Filter

B: AUTOMATIC TRANSMISSION

1. ELECTRONIC-HYDRAULIC CONTROL SYSTEM

The electronic-hydraulic control system consists of various sensors and switches, a transmission control module (TCM) and the hydraulic controller including solenoid valves. The system controls the transmission proper including shift control, lock-up control, overrunning clutch control, line pressure control and shift timing control. It also controls the AWD transfer clutch. In other words, the system detects various operating conditions from various input signals and sends output signals to shift solenoids 1, 2 and 3 and duty solenoids A, B and C (a total of six solenoids).

2. SCHEMATIC



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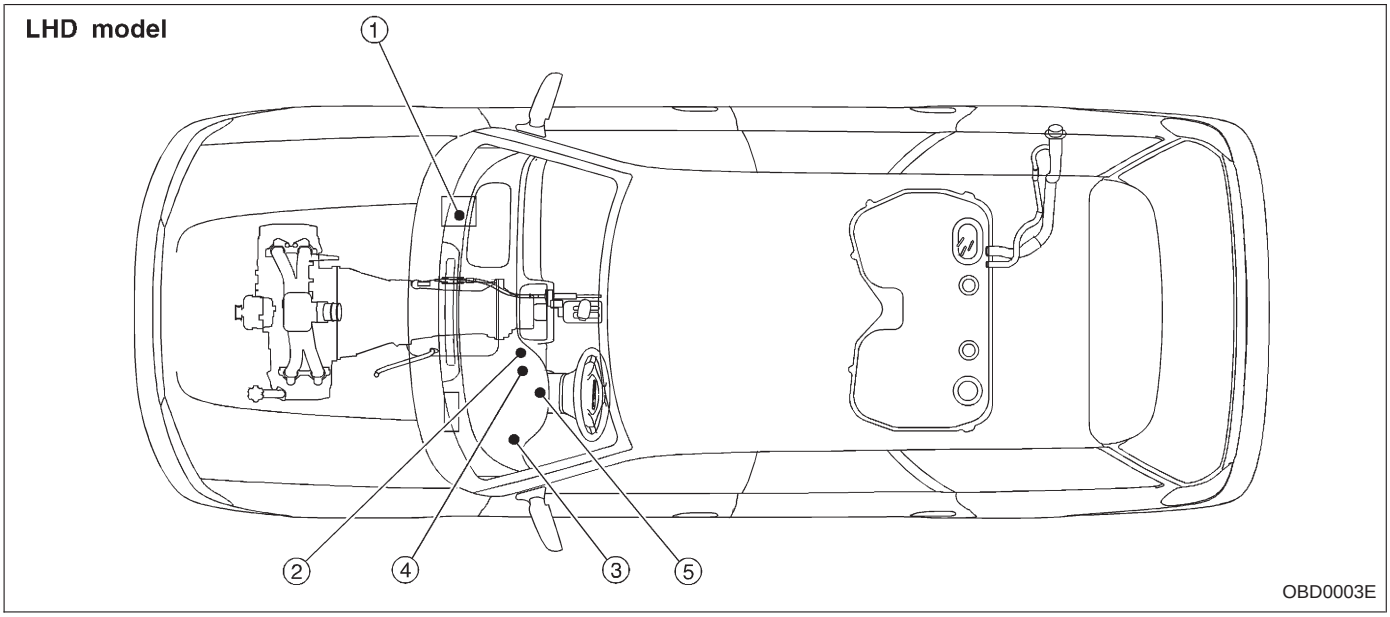
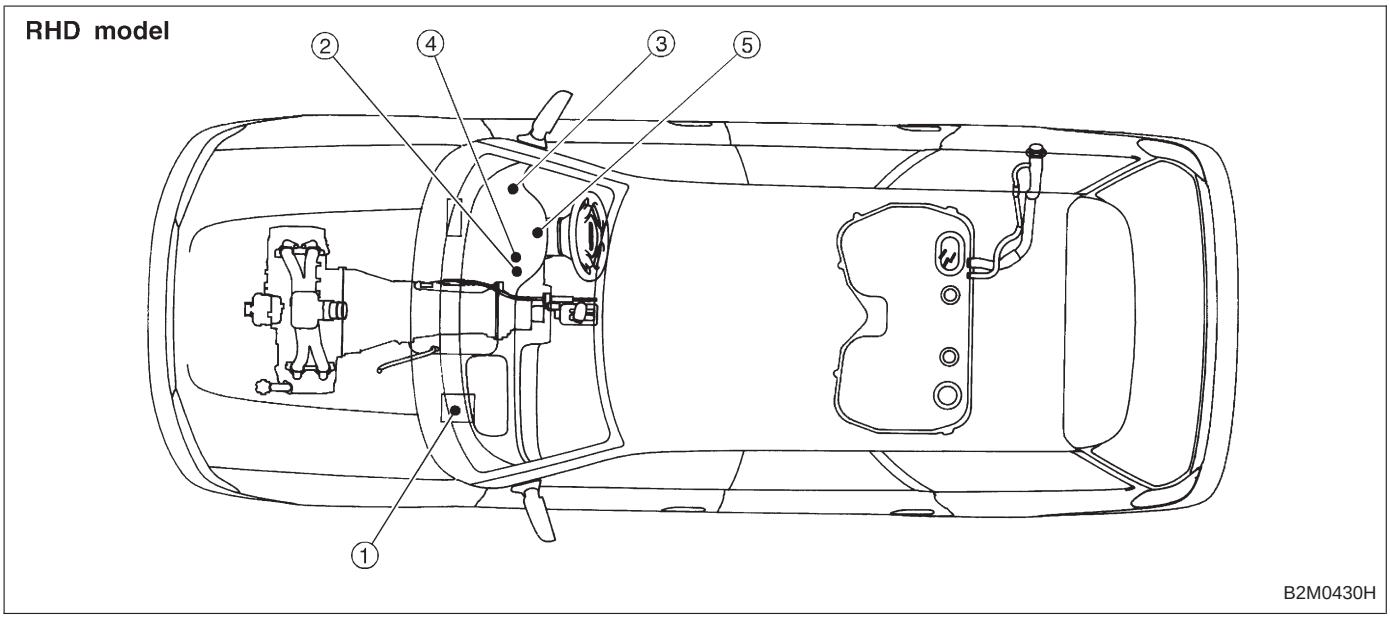
2. Electrical Components Location

A: ENGINE

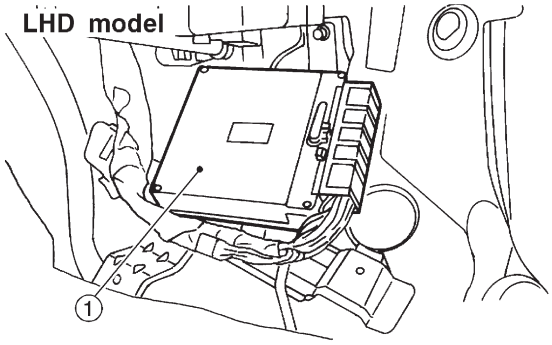
1. MODULE





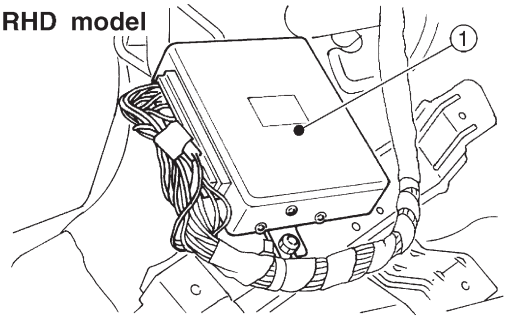
① Engine control module (ECM)
② Data link connector (for Subaru select monitor only)
③ Data link connector (for Subaru select monitor and OBD-II general scan tool)
④ Test mode connector
⑤ CHECK ENGINE malfunction indicator lamp (MIL)

LHD model



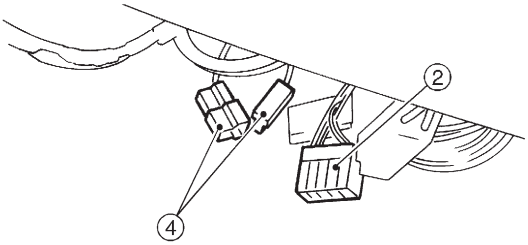
OBD0004B

RHD model



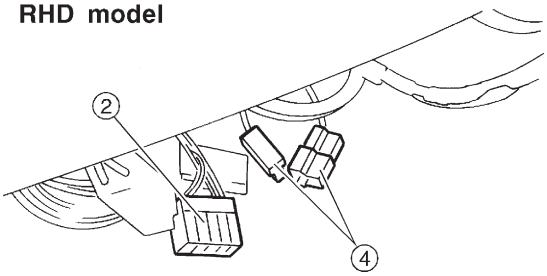
B2M0431B

LHD model



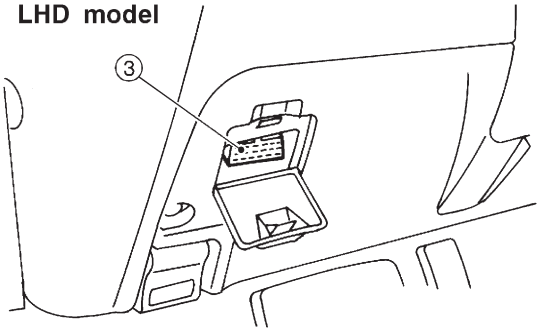
OBD0005G

RHD model



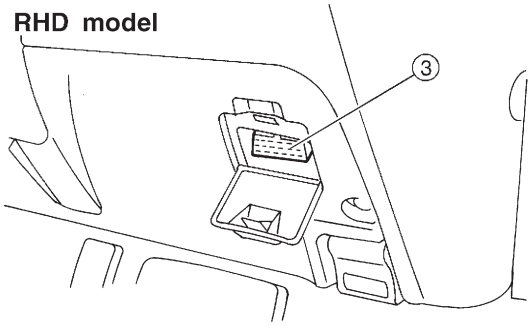
B2M0432C

LHD model



OBD0006E

RHD model



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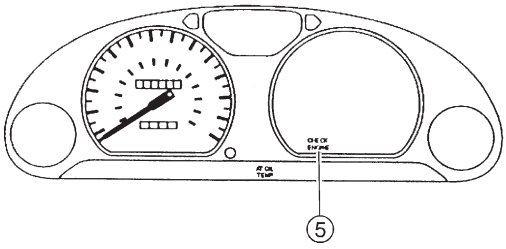
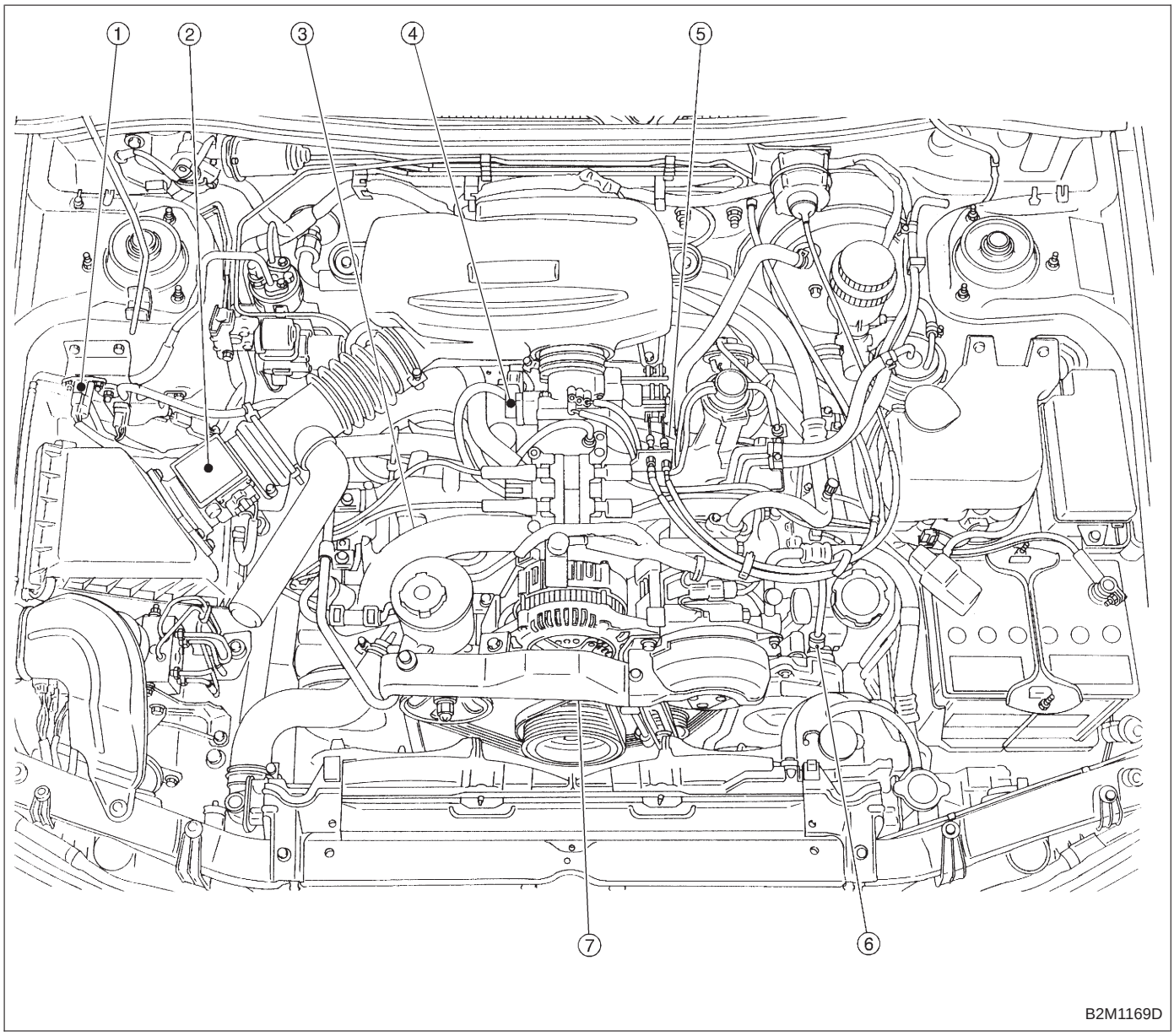
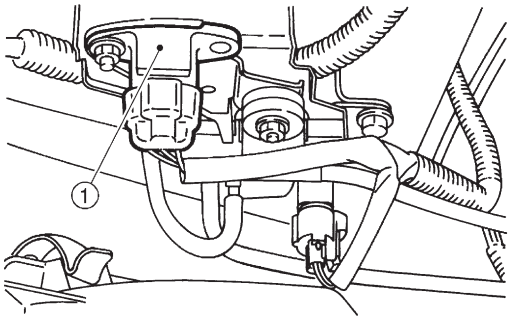


B2M0470A

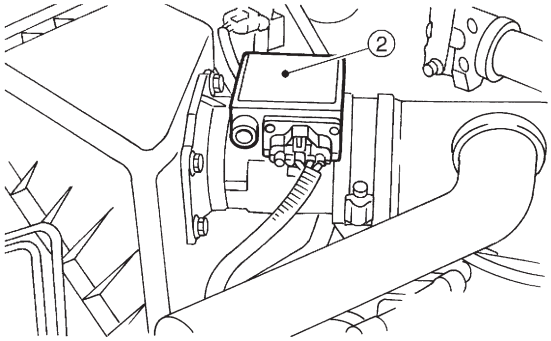
2. SENSOR



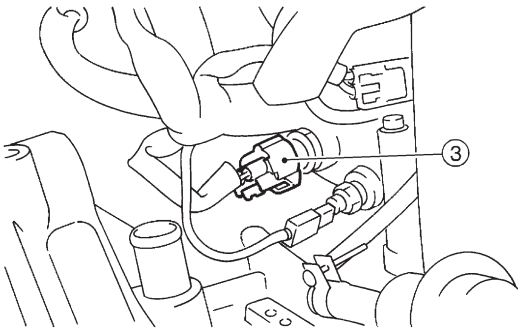
① Pressure sensor
② Mass air flow sensor
③ Engine coolant temperature sensor
④ Throttle position sensor
⑤ Knock sensor
⑥ Camshaft position sensor
⑦ Crankshaft position sensor



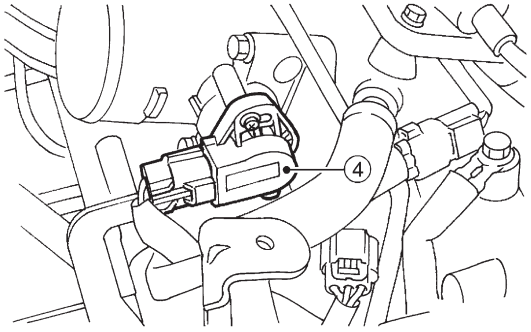
B2M0776A



B2M1034A



B2M1690A



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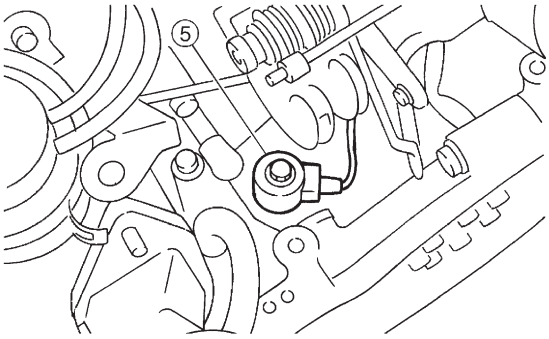

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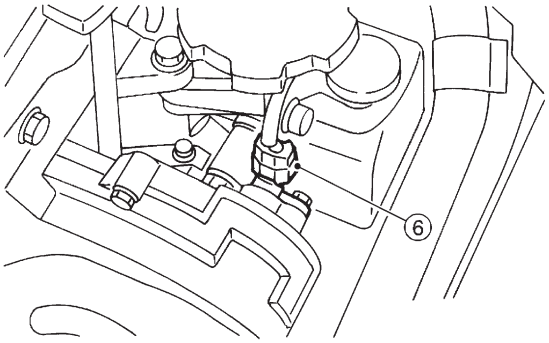
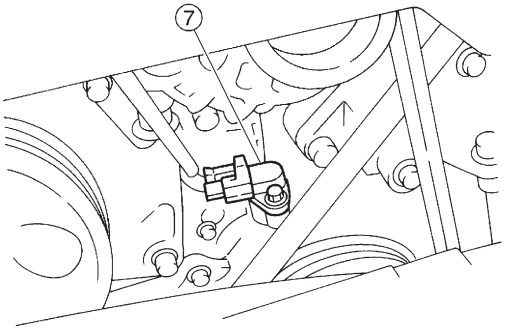
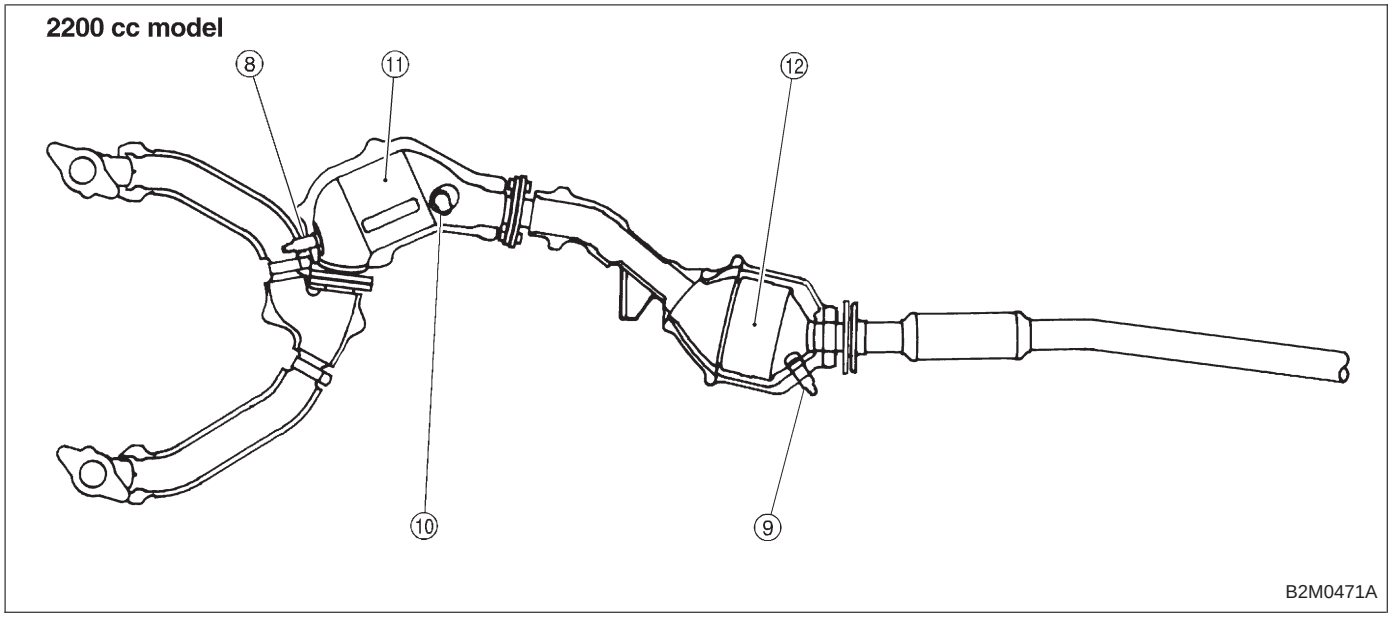
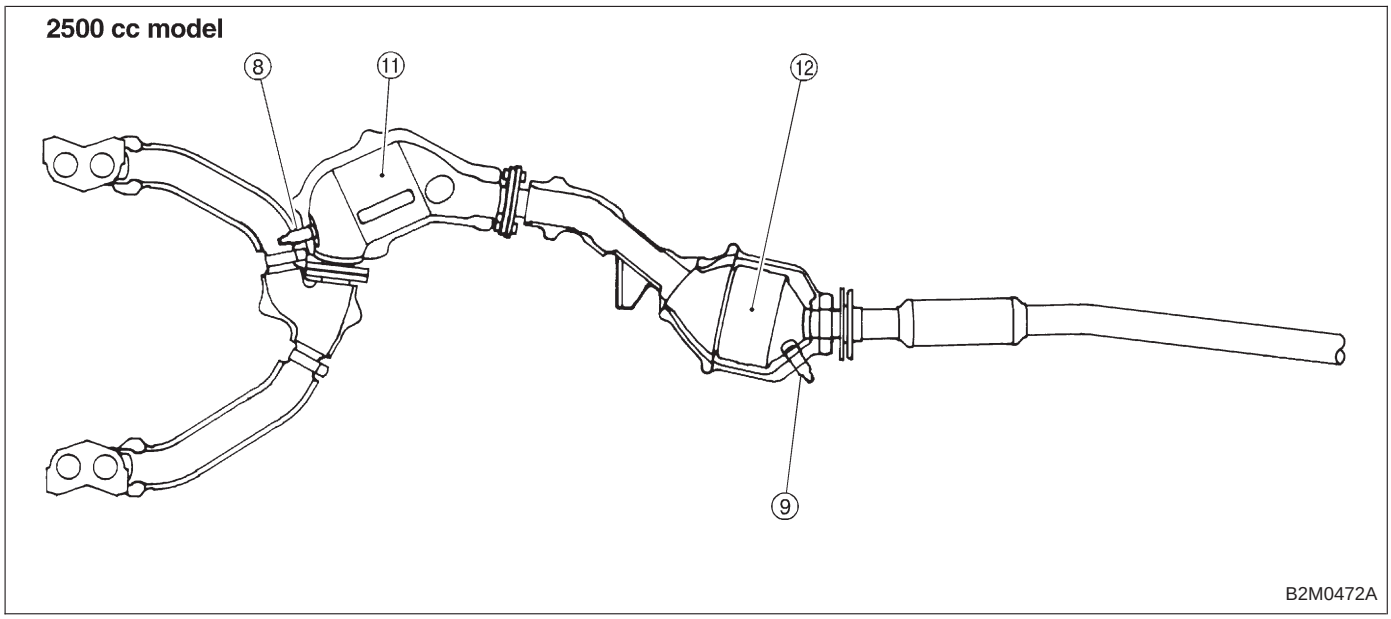


OBD0015A

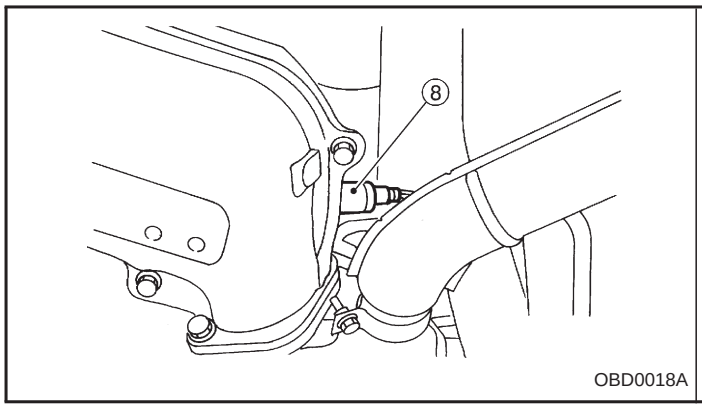


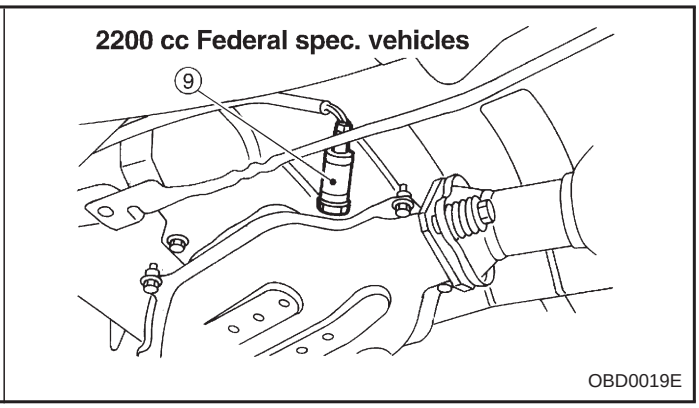
B2M0213B



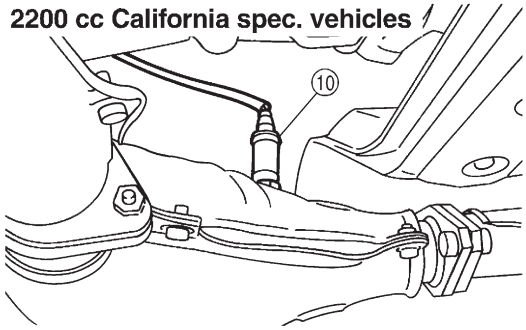


⑧ Front oxygen sensor
⑨ Rear oxygen sensor (Except 2200 cc California spec. vehicles)
⑩ Rear oxygen sensor (2200 cc California spec. vehicles)
⑪ Front catalytic converter
⑫ Rear catalytic converter

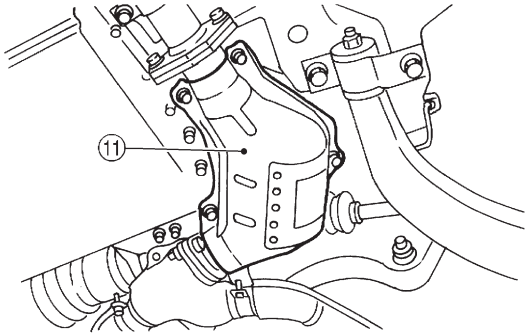




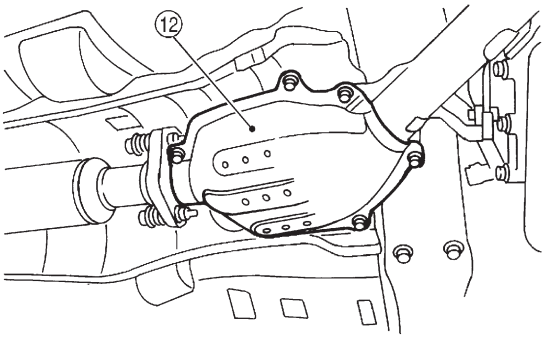
2200 cc California spec. vehicles



B2M0473C

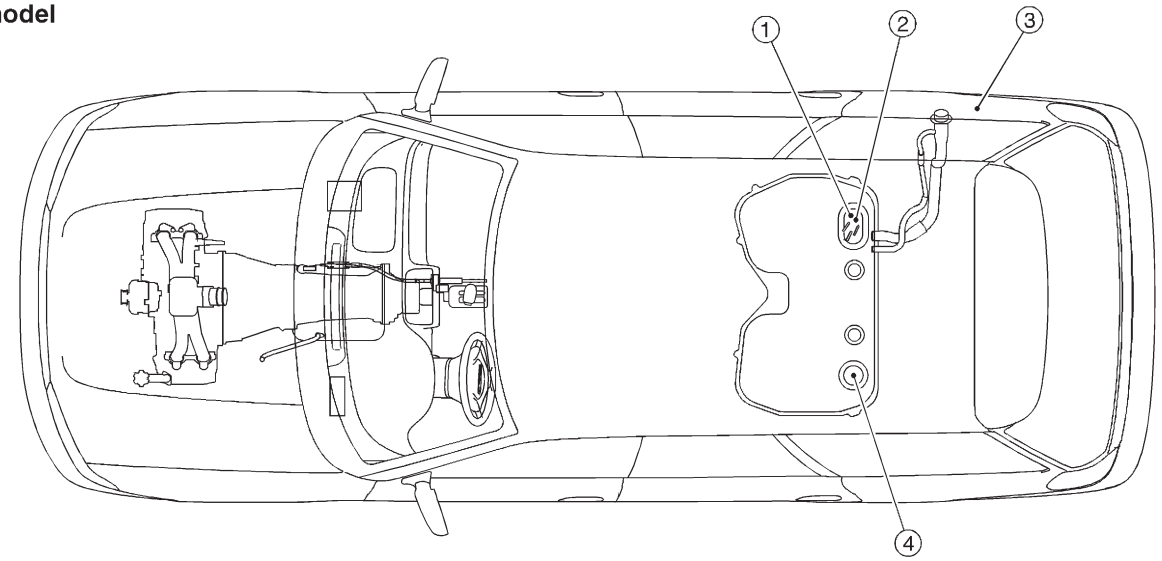


OBD0524C



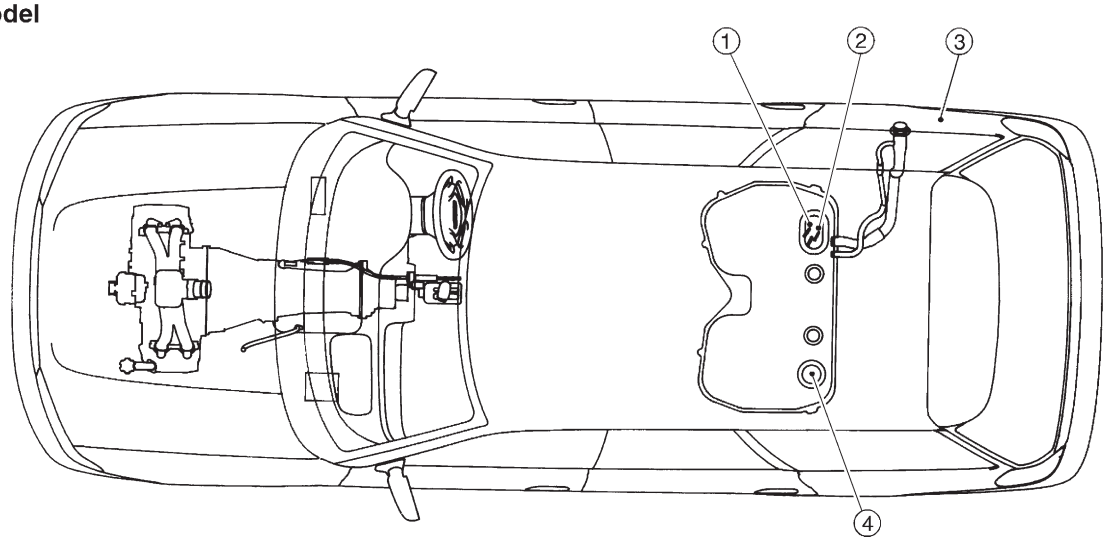
OBD0525C

LHD model



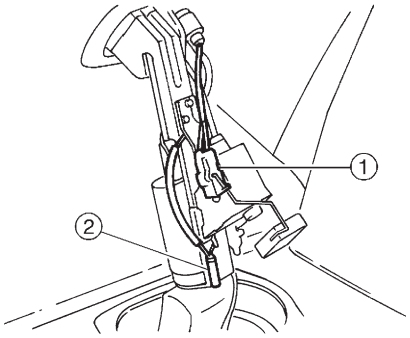
OBD0003F

RHD model

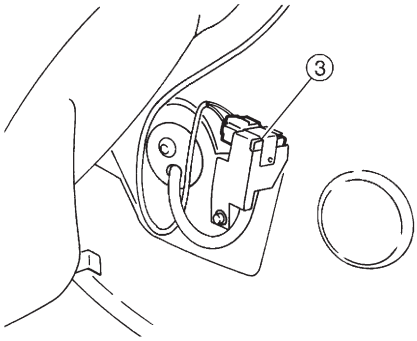


B2M0430F

① Fuel level sensor
② Fuel temperature sensor (2200 cc AWD except Taiwan spec. vehicles)
③ Fuel tank pressure sensor (2200 cc AWD except Taiwan spec. vehicles)
④ Fuel sub level sensor



B2M0921A



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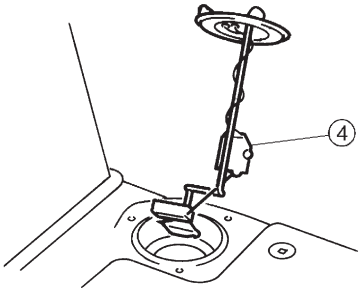
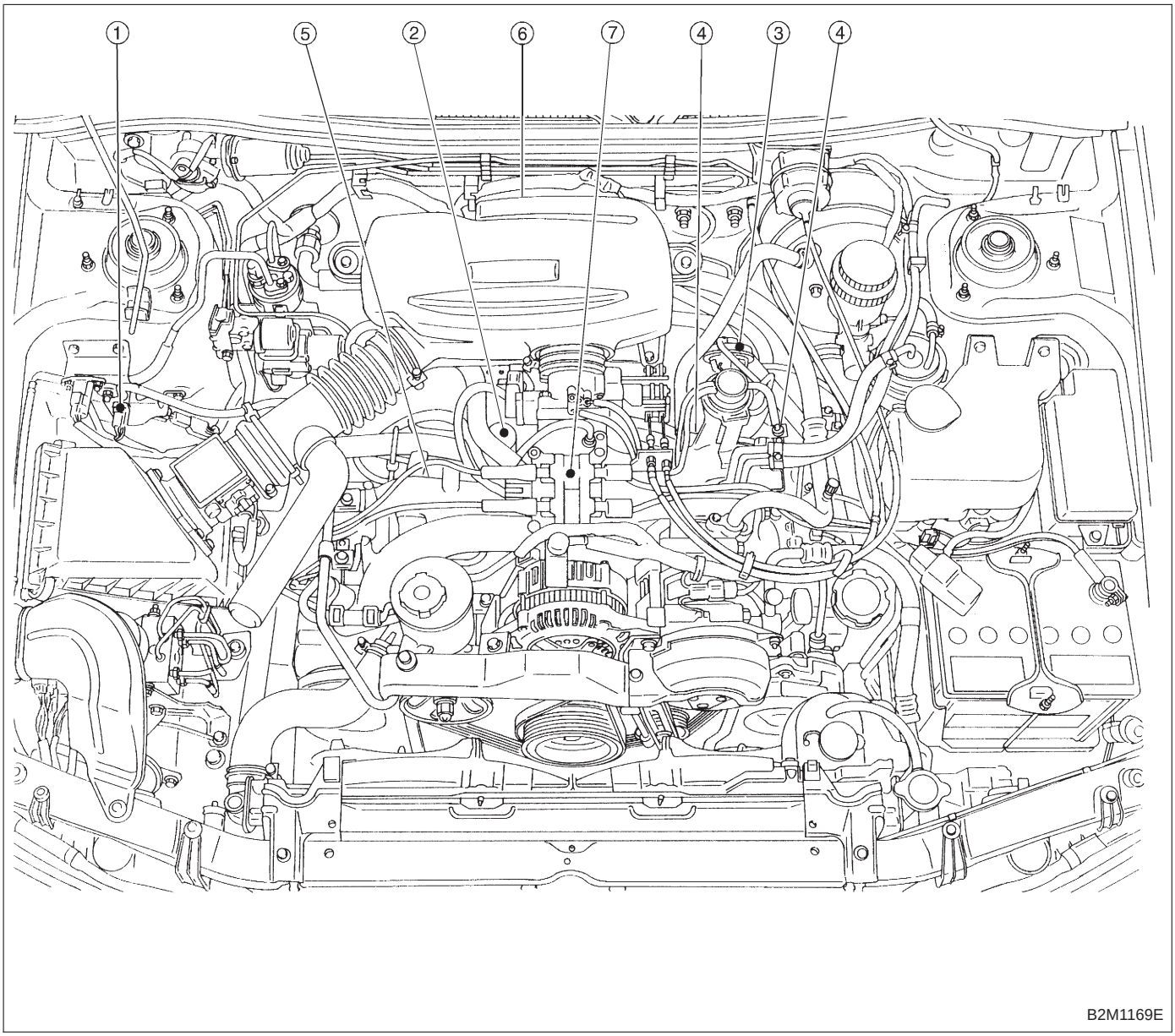
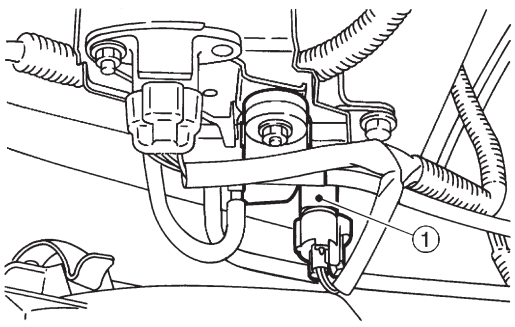


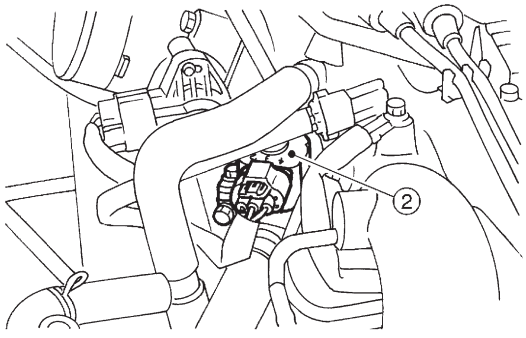
B2M0946A

3. SOLENOID VALVE, EMISSION CONTROL SYSTEM PARTS AND IGNITION SYSTEM PARTS

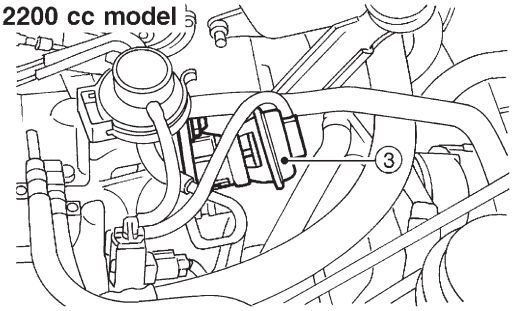


① Pressure sources switching solenoid valve
② Idle air control solenoid valve
③ EGR valve (Except 2200 cc MT vehicles)
④ EGR control solenoid valve (Except 2200 cc MT vehicles)
⑤ Purge control solenoid valve
⑥ Ignitor
⑦ Ignition coil



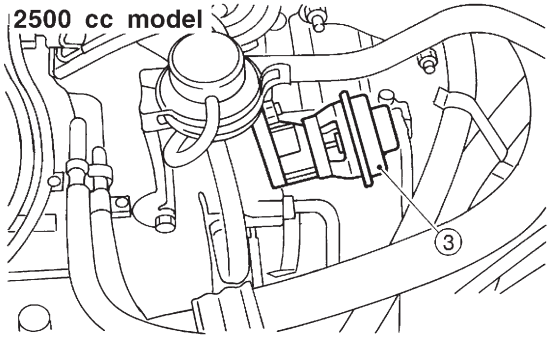


2200 cc model



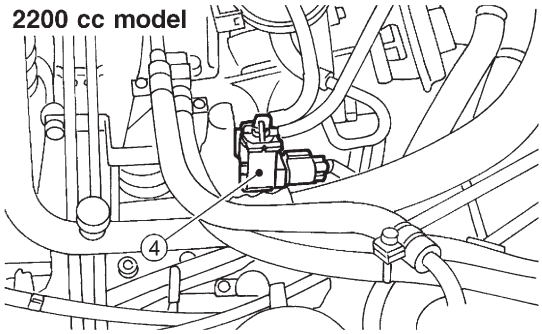
B2M1037A

2500 cc model



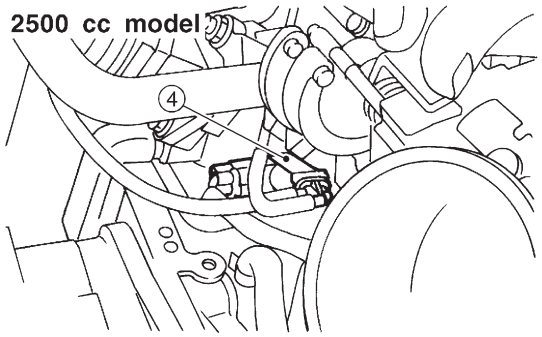
B2M0670B

2200 cc model

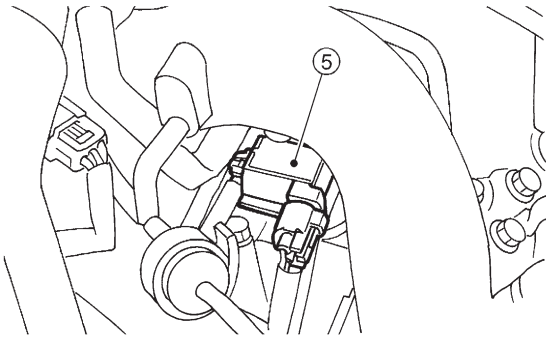


B2M1038A

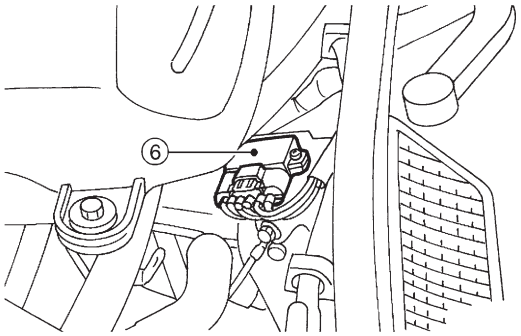
2500 cc model



OBD0024B

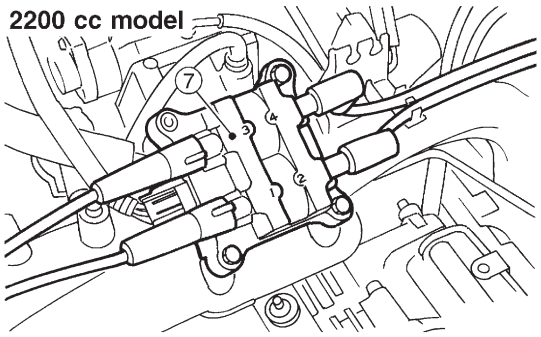


B2M1039A



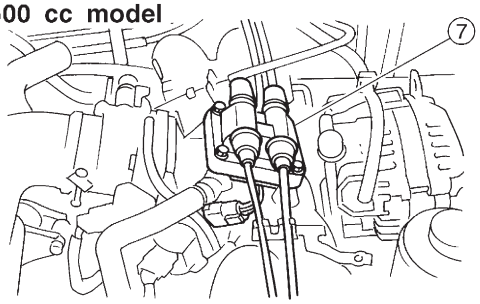
B2M1040A

2200 cc model



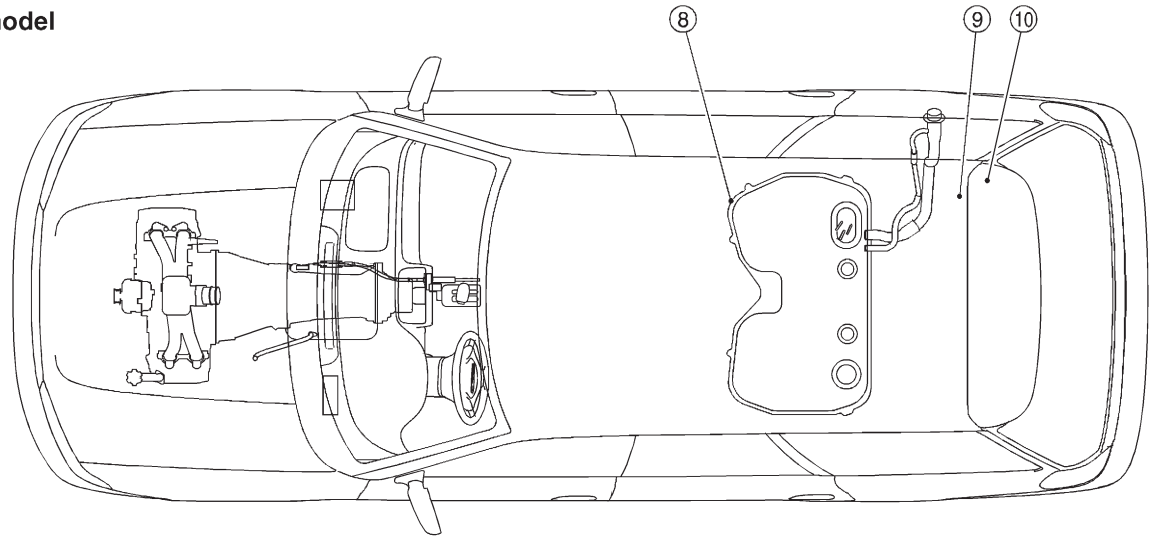
B2M1041A

2500 cc model



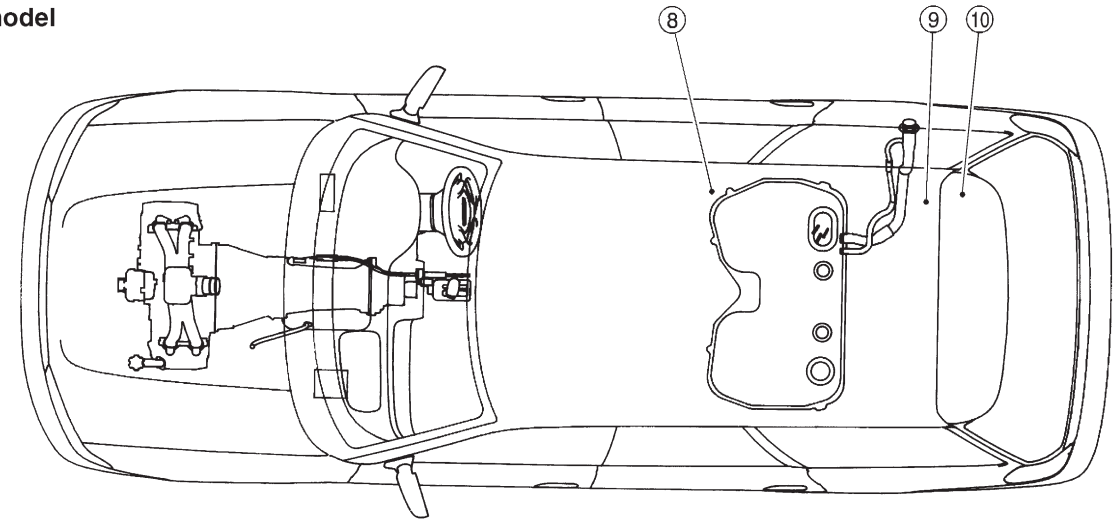
B6M0160C

LHD model



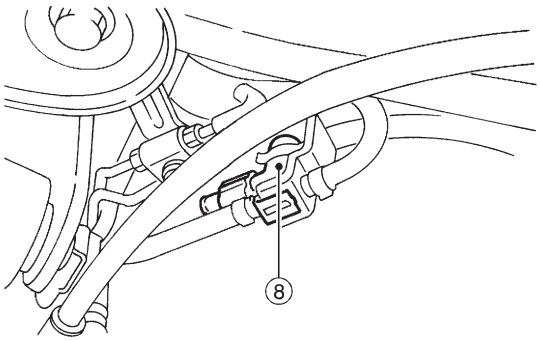
OBD0003G

RHD model

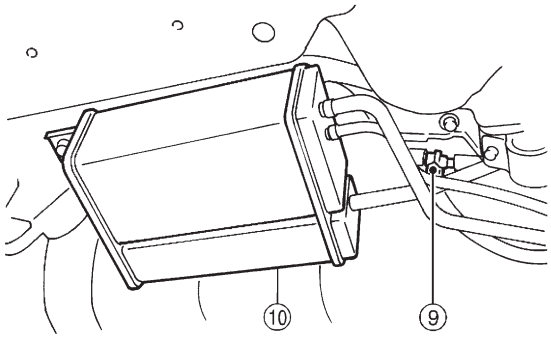


B2M0430G

⑧ Pressure control solenoid valve (2200 cc AWD except Taiwan spec. vehicles)
⑨ Vent control solenoid valve (2200 cc except AWD Taiwan spec. vehicles)
⑩ Canister (2200 cc AWD except Taiwan spec. vehicles)

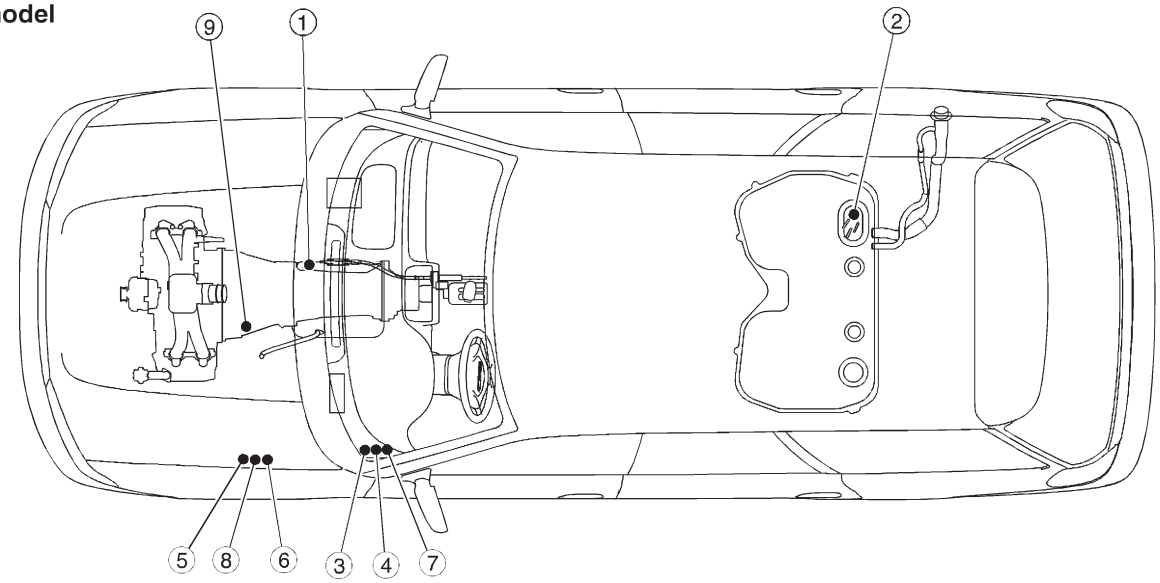


B2M0923A



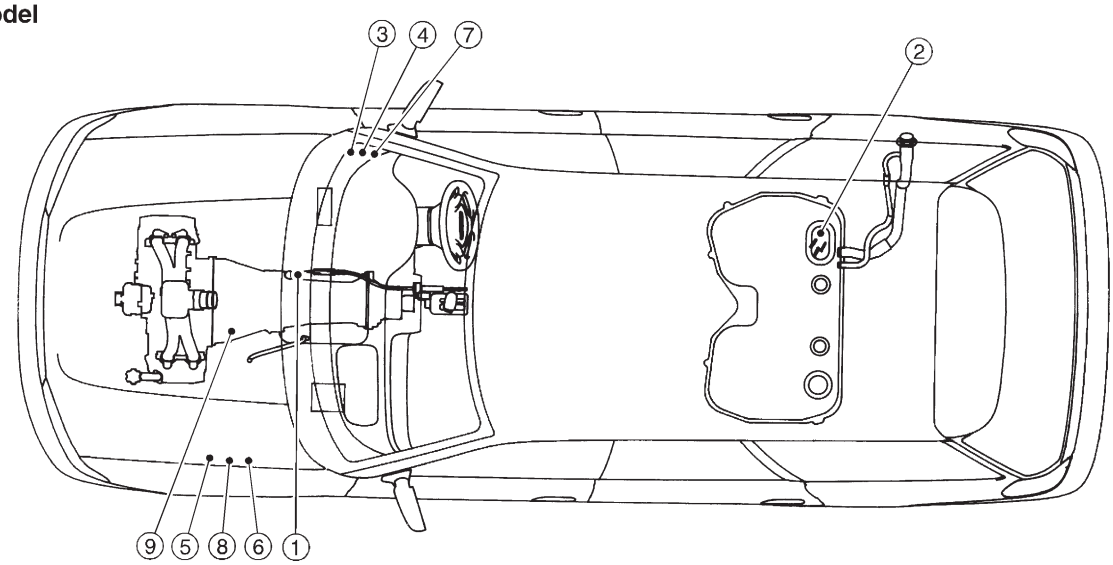
B2M0924A

LHD model



OBD0003H

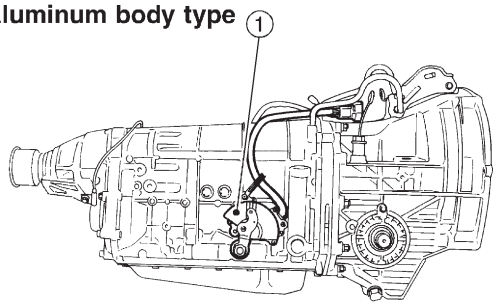
RHD model



B2M1042A

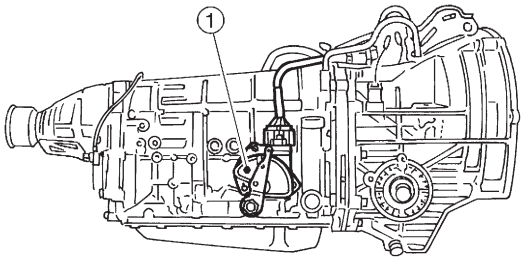
① Inhibitor switch (AT vehicles only)
② Fuel pump
③ Main relay
④ Fuel pump relay
⑤ Radiator main fan relay 1 (With A/C models only)
⑥ Radiator main fan relay 2 (With A/C models only)
⑦ Radiator sub fan relay 1 (With A/C models)
Main fan relay (Without A/C models)
⑧ Radiator sub fan relay 2 (With A/C models only)
⑨ Starter

Aluminum body type

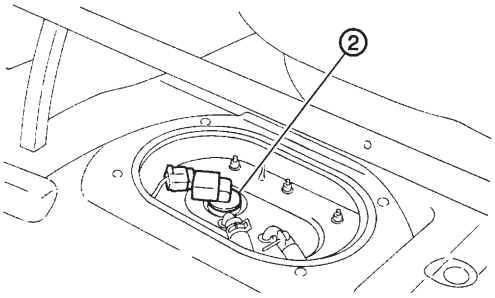


OBD0047C

Plastic body type

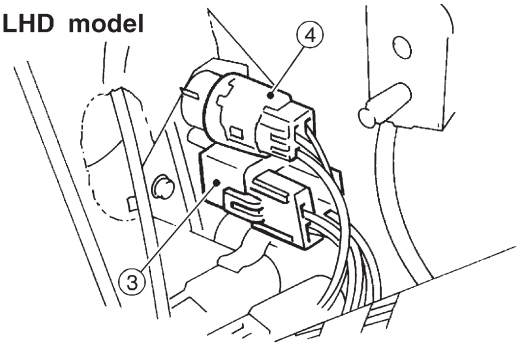


B2M1043E



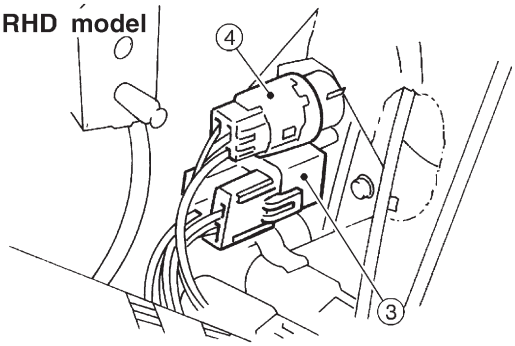
B2M0216A

LHD model

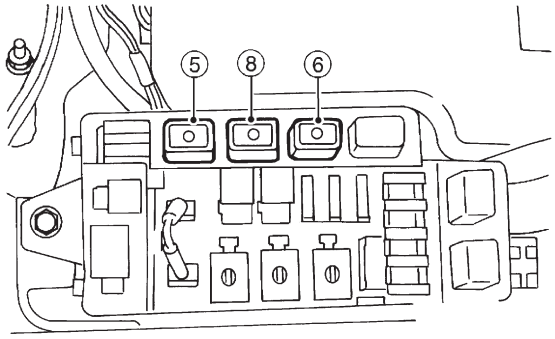


B2M0218C

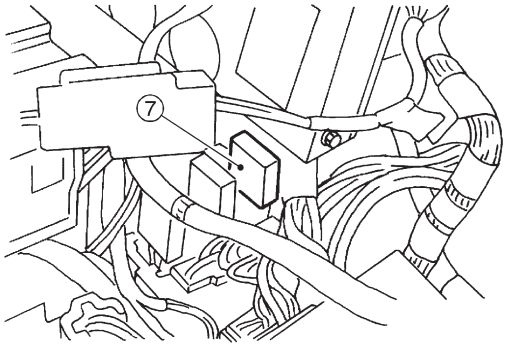
RHD model



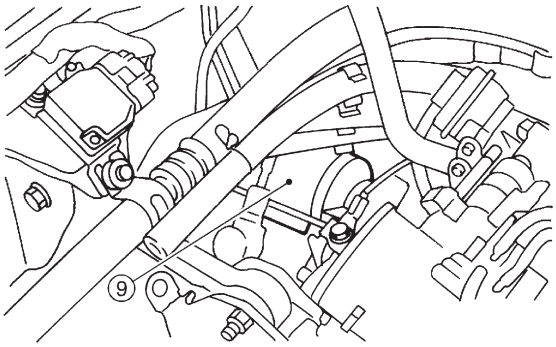
B2M0434B



OBD0034A



OBD0036A

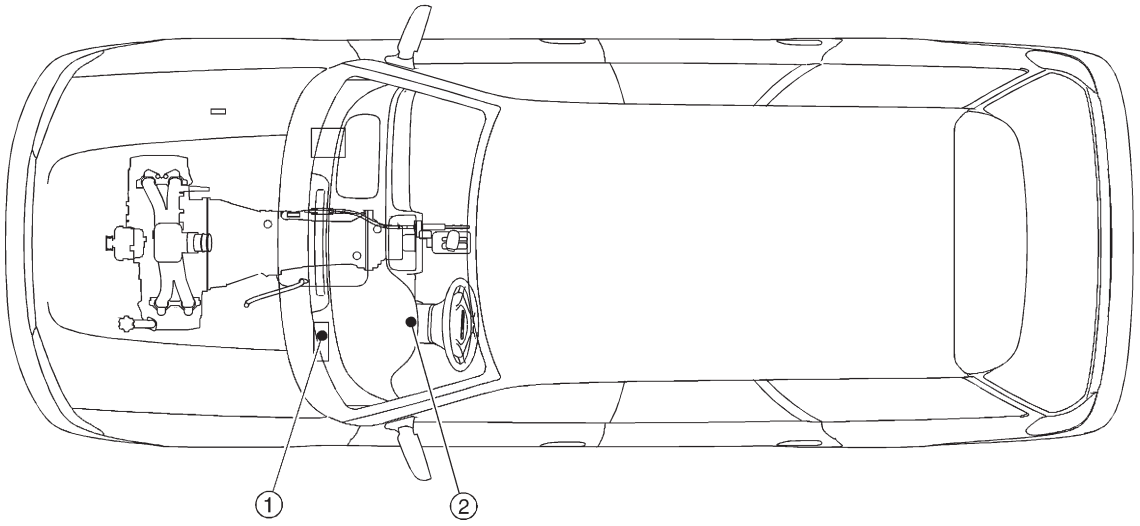


OBD0038A

B: TRANSMISSION

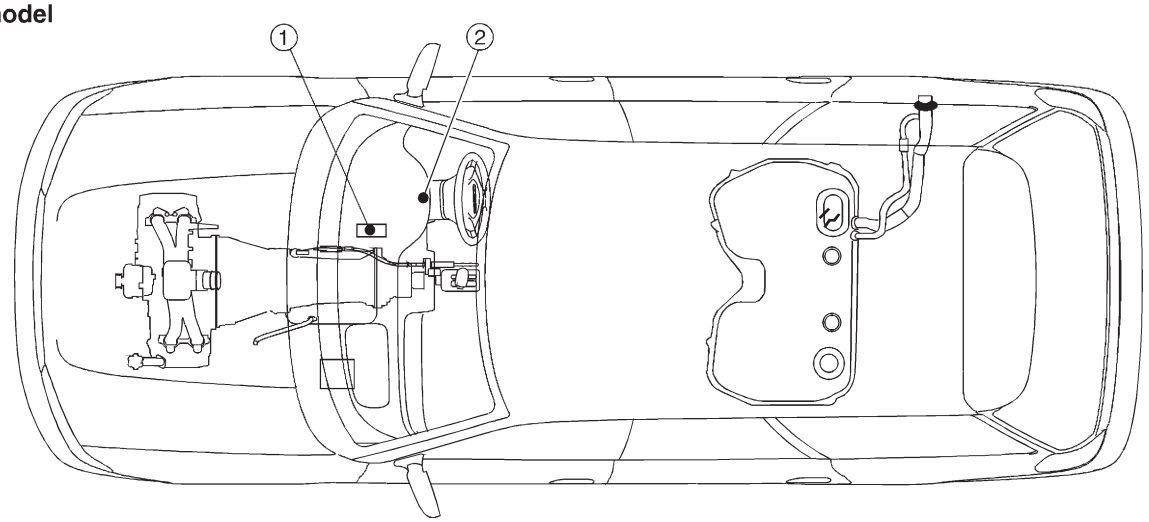
1. MODULE

LHD model



OBD0039B

RHD model

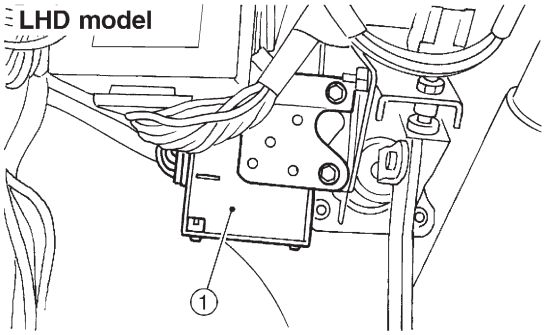


B2M1033A

① Transmission Control Module (TCM) [AT vehicles]

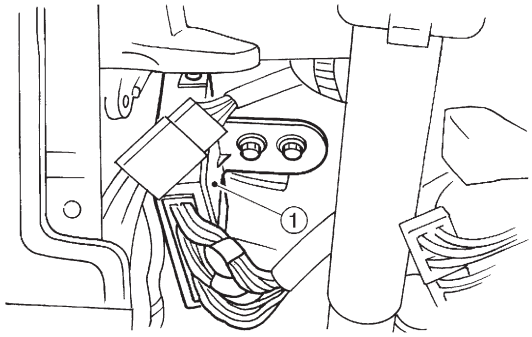
② AT diagnostic indicator light [AT vehicles]

LHD model

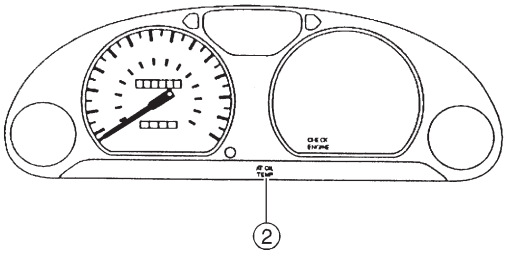


B3M0443F

RHD model

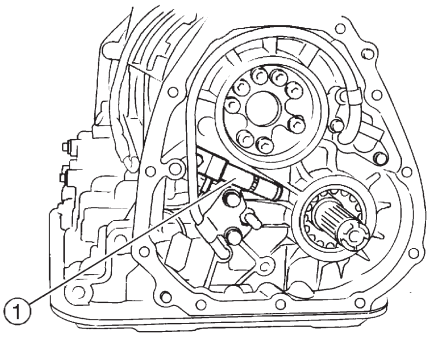


B3M0445D

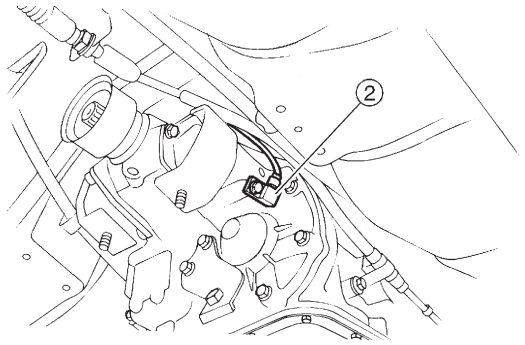


B2M0470B

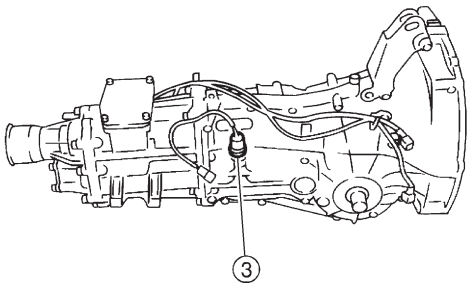
2. SENSOR



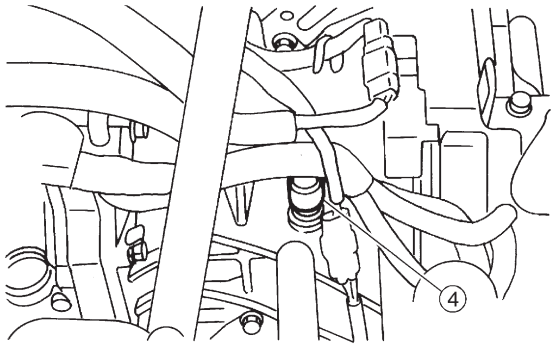
OBD0041A



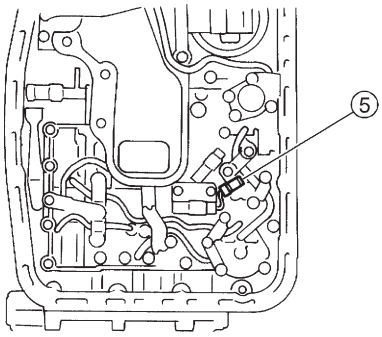
OBD0042A



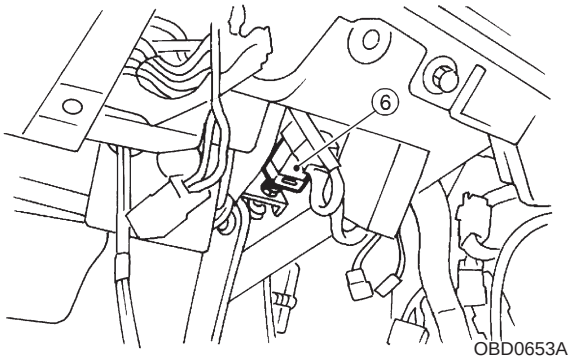
OBD0043A



OBD0044A



H2M1145B

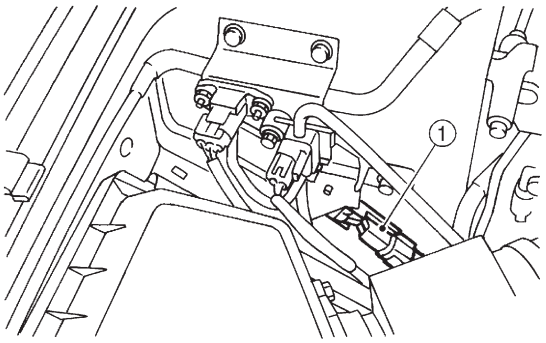


OBD0653A

① Vehicle speed sensor 1 [AT FWD vehicles]
② Vehicle speed sensor 1 [AT AWD vehicles]
③ Vehicle speed sensor 2 [MT vehicles]
④ Vehicle speed sensor 2 [AT vehicles]
⑤ ATF temperature sensor [AT vehicles]
⑥ Brake light switch

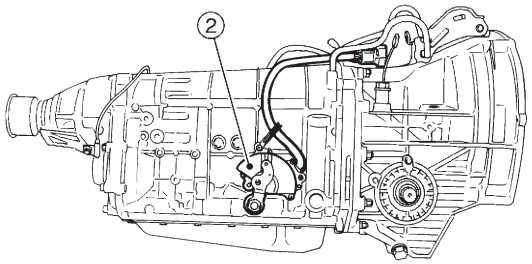
3. SOLENOID VALVE AND RELAY

- **For AT vehicles**



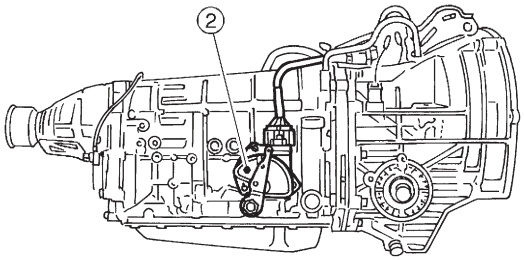
OBD0046B

Aluminum body type

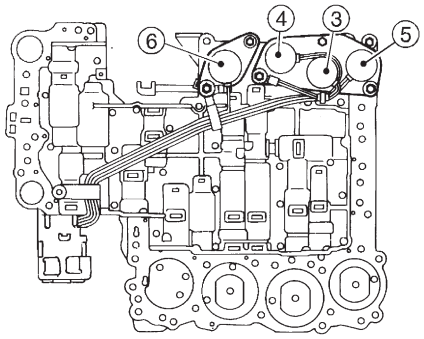


OBD0047D

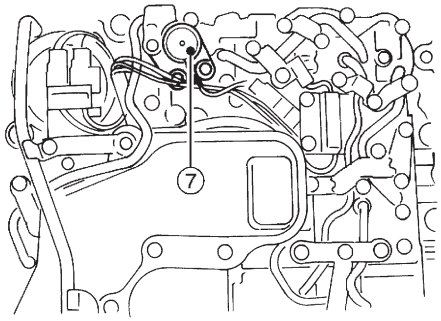
Plastic body type



B2M1043D



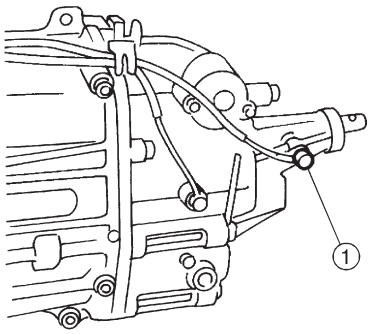
OBD0048A



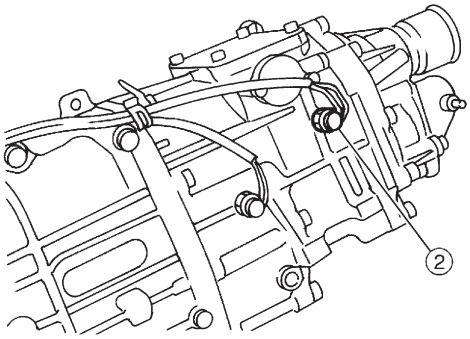
H2M1147A

① Dropping resistor
② Inhibitor switch
③ Shift solenoid valve 1
④ Shift solenoid valve 2
⑤ Shift solenoid valve 3
⑥ Duty solenoid valve A
⑦ Duty solenoid valve B

● **For MT vehicles**



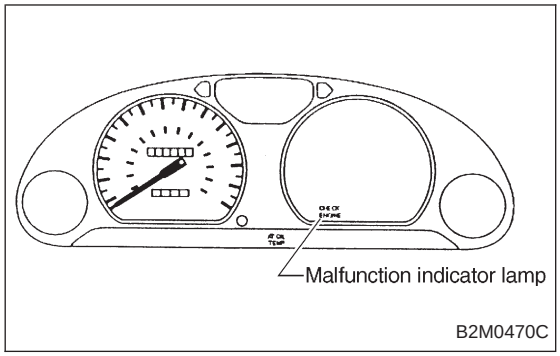
OBD0051A



OBD0526A

① Neutral position switch (FWD models)

② Neutral position switch (AWD models)

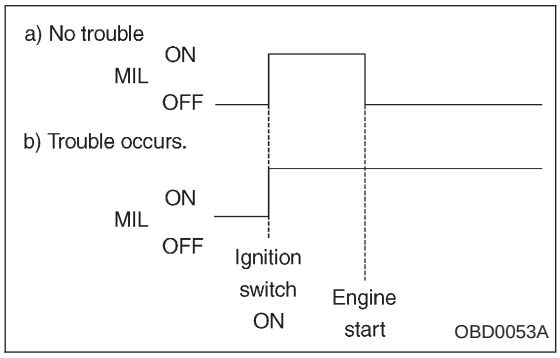


3. Diagnosis System

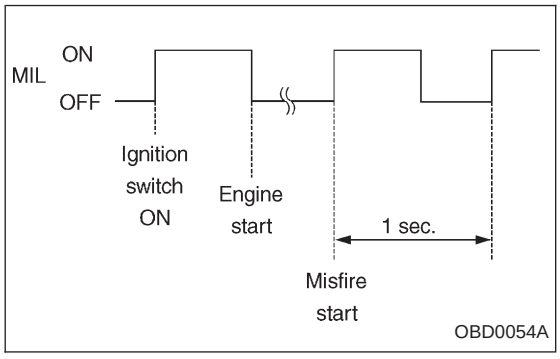
A: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL)

1. ACTIVATION OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL)

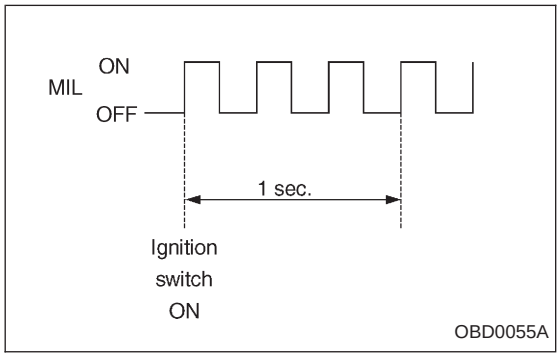
1) When ignition switch is turned to ON (engine off), the CHECK ENGINE malfunction indicator lamp (MIL) in the combination meter illuminates.
NOTE:
If the MIL does not illuminate, perform diagnostics of the CHECK ENGINE light circuit or the combination meter circuit. <Ref. to 2-7 [T700].>



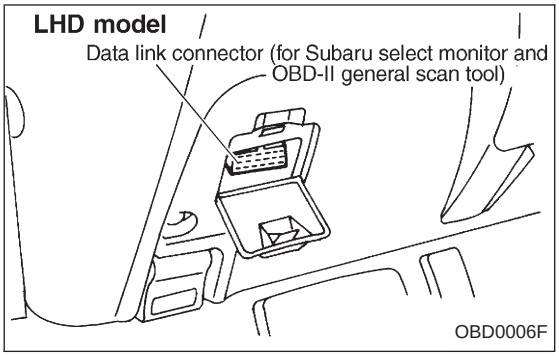
2) After starting the engine, the MIL goes out. If it does not, either the engine or the emission control system is malfunctioning.

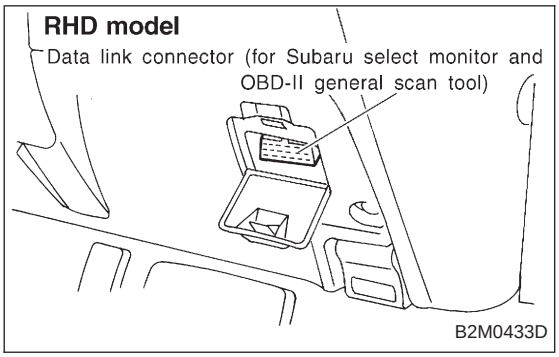


3) If the diagnosis system senses a misfire which could damage the catalyzer, the MIL will blink at a cycle of 1 Hz.



4) When ignition switch is turned to ON (engine off) or to “START” with the test mode connector connected, the MIL blinks at a cycle of 3 Hz.





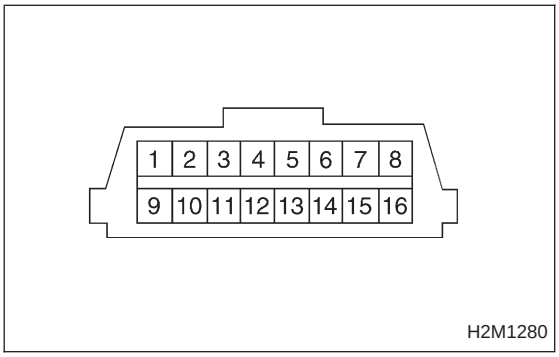
B: OBD-II GENERAL SCAN TOOL

1. HOW TO USE OBD-II GENERAL SCAN TOOL

1) Prepare a general scan tool (OBD-II general scan tool) required by SAE J1978.
2) Open the cover and connect the OBD-II general scan tool to the data link connector located in the lower portion of the instrument panel (on the driver's side), to the lower cover.
3) Using the OBD-II general scan tool, call up diagnostic trouble code(s) and freeze frame data.
OBD-II general scan tool functions consist of:

(1) MODE $01: Current powertrain diagnostic data
(2) MODE $02: Powertrain freeze frame data
(3) MODE $03: Emission-related powertrain diagnostic trouble codes
(4) MODE $04: Clear/Reset emission-related diagnostic information
(5) MODE $05: Oxygen sensor monitoring test results

Read out data according to repair procedures.
(For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.)
NOTE:
For details concerning diagnostic trouble codes, refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST. <Ref. to 2-7 [T10A0], [T11A0].>



2. DATA LINK CONNECTOR (FOR OBD-II GENERAL SCAN TOOL AND SUBARU SELECT MONITOR)

1) This connector is used both for OBD-II general scan tools and the Subaru Select Monitor.
2) Terminal No. 4 to No. 6 of the data link connector is used for the Subaru Select Monitor signal.

CAUTION:
Do not connect any scan tools other than the OBD-II general scan tools and the Subaru Select Monitor, because the circuit for the Subaru Select Monitor may be damaged.

Terminal No.	Contents	Terminal No.	Contents
1	Power supply	9	Blank
2	Blank	10	K line of ISO 9141 CARB
3	Blank	11	Blank
4	Subaru Select Monitor signal (ECM to Subaru Select Monitor)*	12	Ground
5	Subaru Select Monitor signal (Subaru Select Monitor to ECM)*	13	Ground
6	Subaru Select Monitor clock*	14	Blank
7	Blank	15	Blank
8	Blank	16	Blank

*: Circuit only for Subaru Select Monitor

3. CURRENT POWERTRAIN DIAGNOSTIC DATA (MODE $01)

Refers to data denoting the current operating condition of analog input/output, digital input/output and/or the powertrain system.
A list of the support data and PID (Parameter Identification) codes are shown in the following table.

PID	Data	Unit of measure
01	Number of emission-related powertrain trouble codes and MIL status	ON/OFF
03	Fuel system control status	—
04	Calculated engine load value	%
05	Engine coolant temperature	°C
06	Short term fuel trim	%
07	Long term fuel trim	%
0B	Intake manifold absolute pressure	kPa
0C	Engine revolution	rpm
0D	Vehicle speed	km/h
0E	Ignition timing advance	°
10	Air flow rate from mass air flow sensor	g/sec
11	Throttle valve opening angle	%
13	Check whether oxygen sensor is installed.	—
14	Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor—bank 1	V and %
15	Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor—bank 2	V and %
1C	On-board diagnosis system	—

NOTE:
Refer to OBD-II general scan tool manufacturer's instruction manual to access generic OBD-II PIDs (MODE $01).

4. POWERTRAIN FREEZE FRAME DATA (MODE $02)

Refers to data denoting the operating condition when trouble is sensed by the on-board diagnosis system.
A list of the support data and PID (Parameter Identification) codes are shown in the following table.

PID	Data	Unit of measure
02	Trouble code that caused CARB required freeze frame data storage	—
03	Fuel system control status	—
04	Calculated engine load value	%
05	Engine coolant temperature	°C
06	Short term fuel trim	%
07	Long term fuel trim	%
0B	Intake manifold absolute pressure	kPa
0C	Engine revolution	rpm
0D	Vehicle speed	km/h

NOTE:
Refer to OBD-II general scan tool manufacturer's instruction manual to access freeze frame data (MODE $02).

5. EMISSION-RELATED POWERTRAIN DIAGNOSTIC TROUBLE CODE (MODE $03)

Refers to data denoting emission-related powertrain diagnostic trouble codes.
For details concerning diagnostic trouble codes, refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST. <Ref. to 2-7 [T10A0], [T11A0].>
NOTE:
Refer to OBD-II general scan tool manufacturer's instruction manual to access emission-related powertrain diagnostic trouble codes (MODE $03).

6. CLEAR/RESET EMISSION-RELATED DIAGNOSTIC INFORMATION (MODE $04)

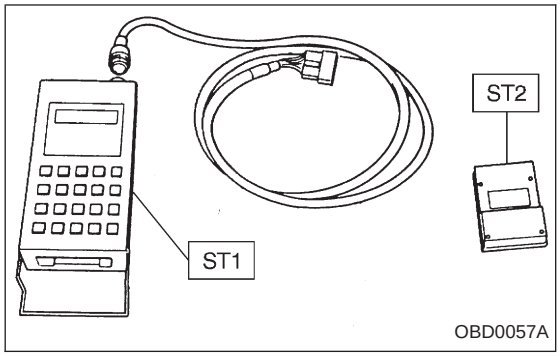
Refers to the mode used to clear or reset emission-related diagnostic information (OBD-II trouble diagnostic information).
NOTE:
Refer to OBD-II general scan tool manufacturer's instruction manual to clear or reset emission-related diagnostic information (MODE $04).

7. OXYGEN SENSOR MONITORING TEST RESULTS (MODE $05)

Refers to the mode using oxygen sensor output data while the on-board diagnosis system is performing diagnosis on the oxygen sensor.
A list of the support oxygen sensor output data and test ID (identification) are shown in the following table.

Test ID	Data	Unit of measure
01	Rich to lean sensor threshold voltage (constant)	V
02	Lean to rich sensor threshold voltage (constant)	V
03	Low sensor voltage for switch time calculation (constant)	V
04	High sensor voltage for switch time calculation (constant)	V
05	Rich to lean sensor switch time (calculated)	sec.
06	Lean to rich sensor switch time (calculated)	sec.
07	Minimum sensor voltage for test cycle (calculated)	V
08	Maximum sensor voltage for test cycle (calculated)	V

NOTE:
Refer to OBD-II general scan tool manufacturer's instruction manual to access oxygen sensor monitoring test results (MODE $05).

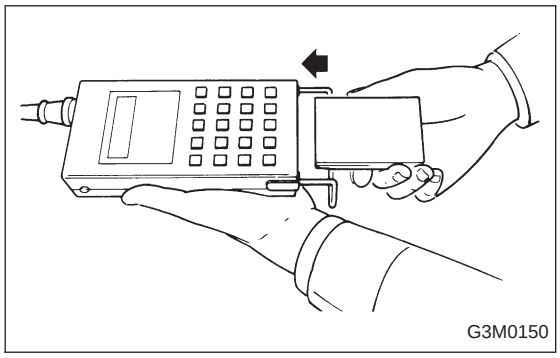


C: SUBARU SELECT MONITOR

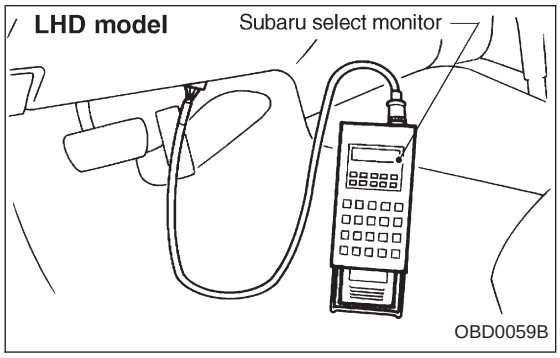
1. HOW TO USE SUBARU SELECT MONITOR

1) Prepare Subaru select monitor and cartridge.

ST1 498307500 SELECT MONITOR KIT
ST2 498346300 CARTRIDGE

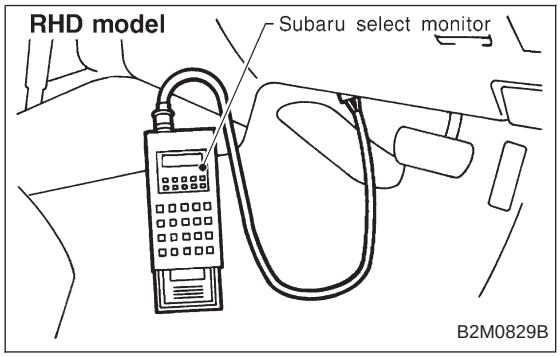


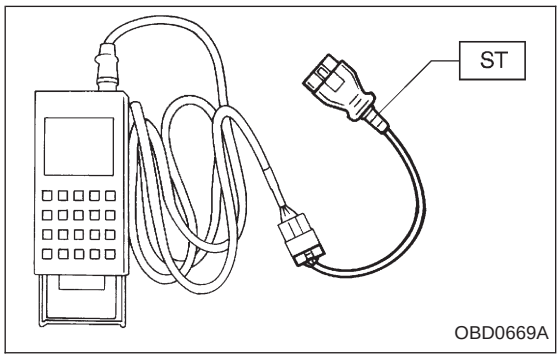
2) Turn ignition switch and Subaru select monitor switch to OFF.
3) Insert cartridge into Subaru select monitor.



4) Connect Subaru select monitor to data link connector.

- Using data link connector for Subaru select monitor only, connect Subaru select monitor to its data link connector located in the lower portion of the instrument panel (on the driver's side), to the side of the center console box.

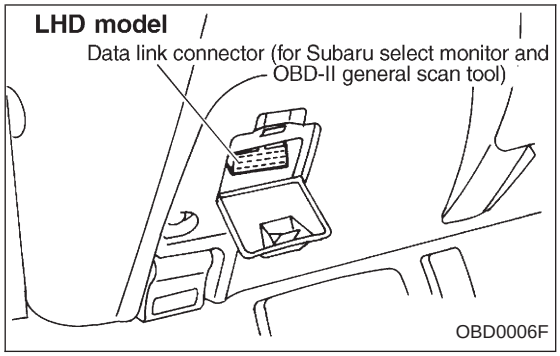




- Using data link connector for Subaru select monitor and OBD-II general scan tool;

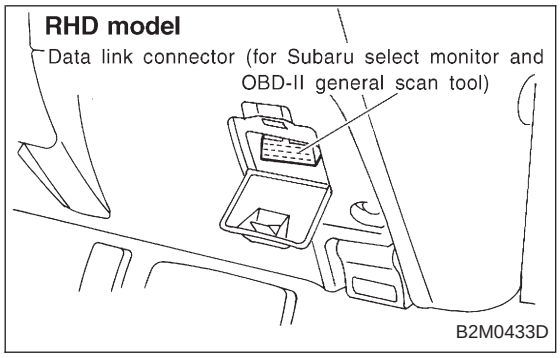
(1) Connect ST to Subaru select monitor cable.

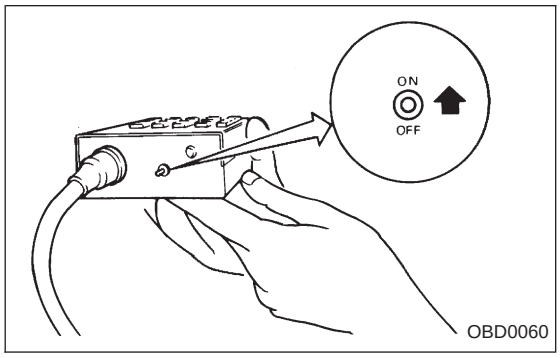
ST 498357200 ADAPTER CABLE



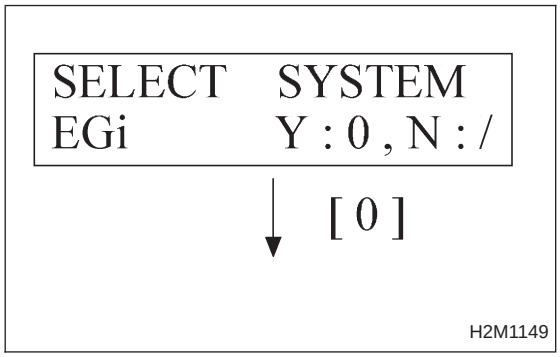
(2) Open the cover and connect Subaru select monitor to data link connector located in the lower portion of the instrument panel (on the driver's side), to the lower cover.

CAUTION:
Do not connect scan tools except for Subaru select monitor and OBD-II general scan tool.



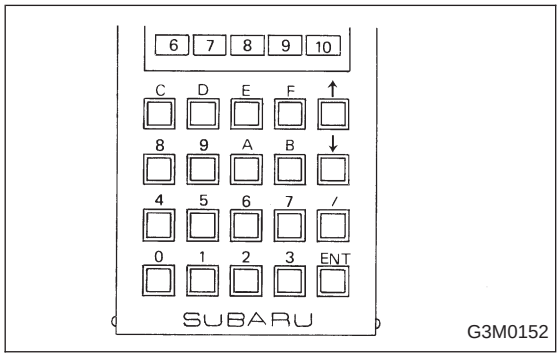


5) Turn ignition switch to ON (engine OFF) and Subaru select monitor switch to ON.
6) Using Subaru select monitor, call up diagnostic trouble code(s) and various data, then record them.

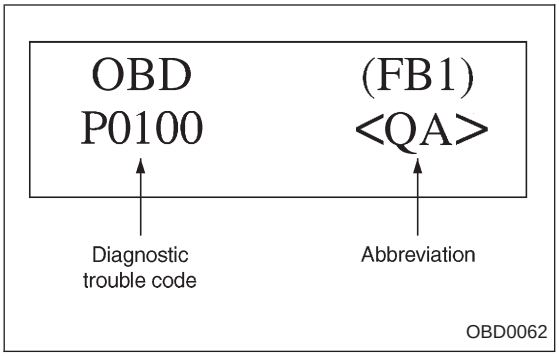


2. READ DIAGNOSTIC TROUBLE CODE (DTC) SHOWN ON DISPLAY. (MODE FB1)

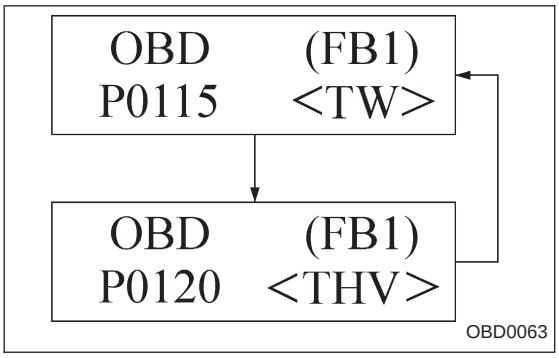
1) Select engine mode using function key.
Press the function key [0].



2) Designate mode using function key.
Press [F] [B] [1] [ENT] in that order.

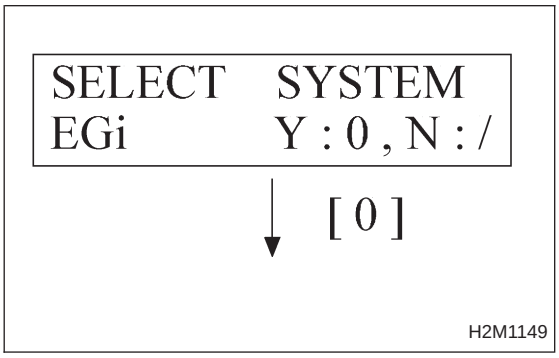


3) Ensure diagnostic trouble code(s) is shown.
(1) When there is only one diagnostic trouble code.



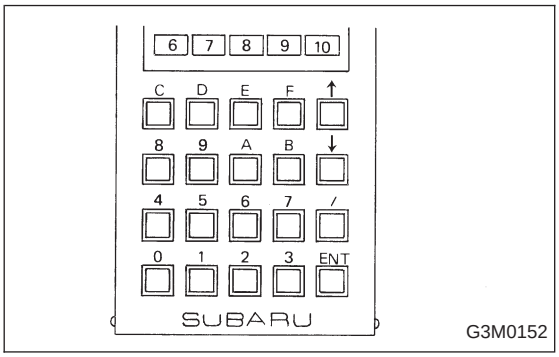
(2) When there are multiple diagnostic trouble codes.

NOTE:
For details concerning diagnostic trouble codes, refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST. <Ref. to 2-7 [T10A0], [T11A0].>

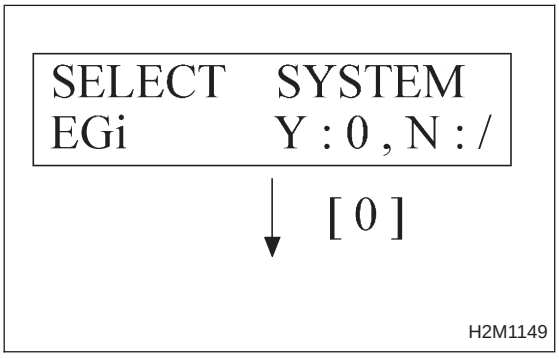


3. READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE. (FUNCTION MODE)

1) Select engine mode using function key.
Press the function key [0].

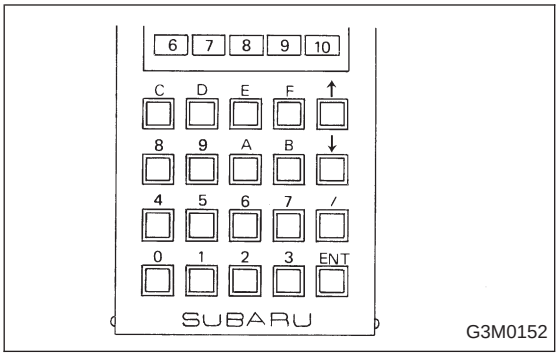


2) Designate mode using function key.
<Ref. to 2-7 [T3C6].>
(Example: Press [F] [0] [1] [ENT] in that order.)
3) Ensure data of input or output signal is shown.



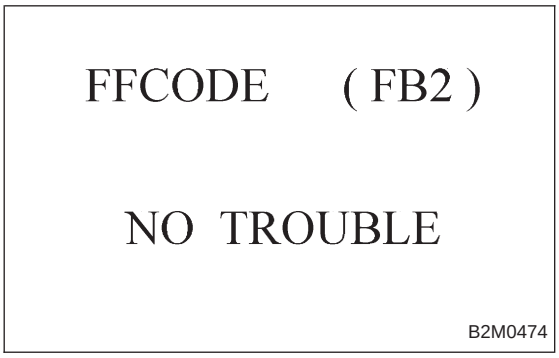
4. READ FREEZE FRAME DATA SHOWN ON DISPLAY. (MODE FB2)

1) Select engine mode using function key.
Press the function key [0].



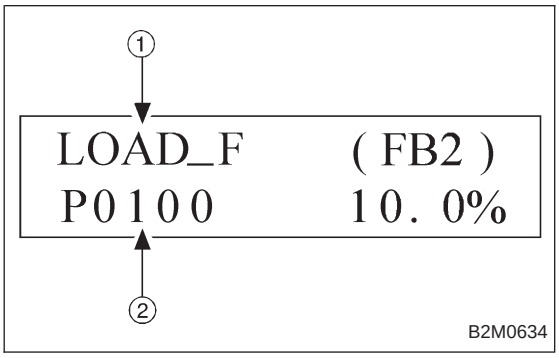
G3M0152

2) Designate mode using function key.
Press [F] [B] [2] [ENT] in that order.



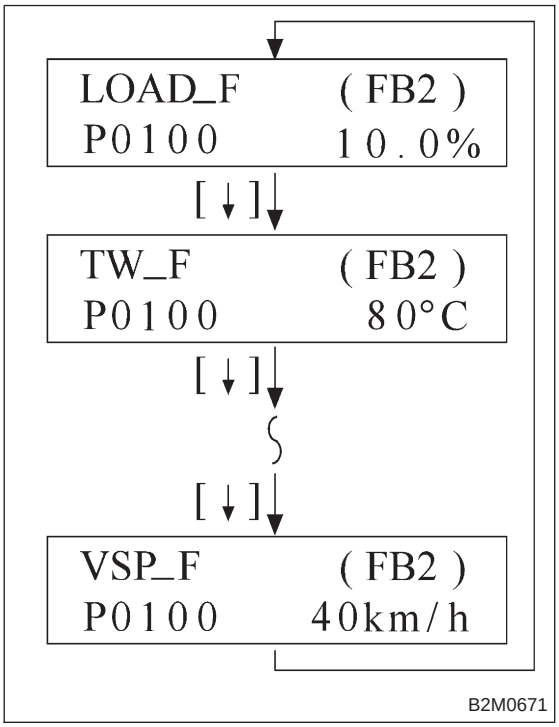
B2M0474

3) Ensure freeze frame data(s) is (are) shown.
(1) When no trouble is detected, or after memory is cleared.



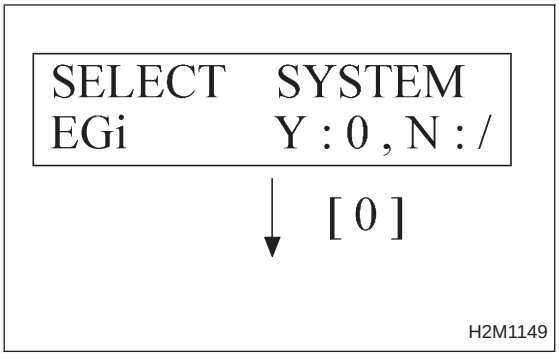
B2M0634

(2) When some trouble is detected.
① Abbreviation
② Diagnostic trouble code of trouble occurred



B2M0671

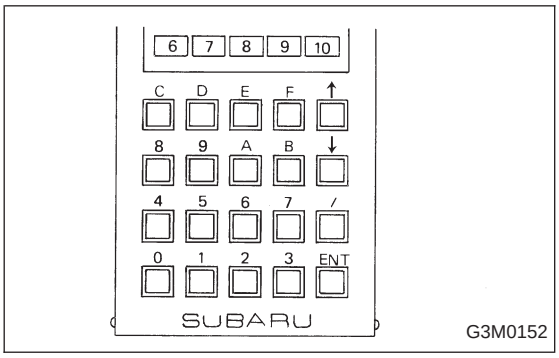
NOTE:
Other freeze frame data is shown on display by pushing the function key [↓].



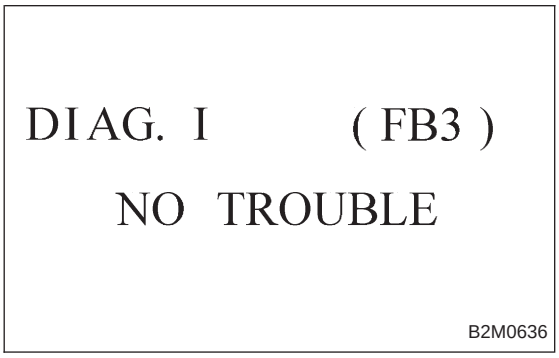
5. READ FREEZE FRAME DATA SHOWN ON DISPLAY. (MODE FB3)

NOTE:
● For items and contents shown on display, refer to "6. READ DATA FUNCTION KEY LIST FOR ENGINE". <Ref. to 2-7 [T3C6].>
● Freeze frame data will not erase without clearing memory.

1) Select engine mode using function key.
Press the function key [0].

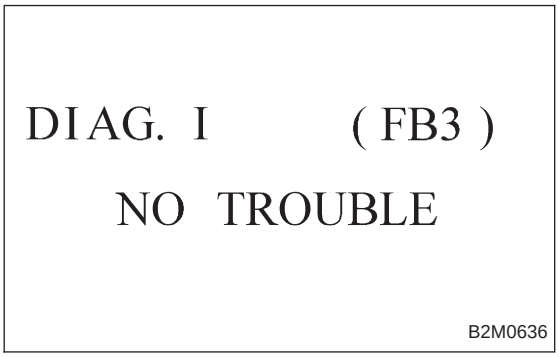


2) Designate mode using function key.
Press [F] [B] [3] [ENT] in that order.

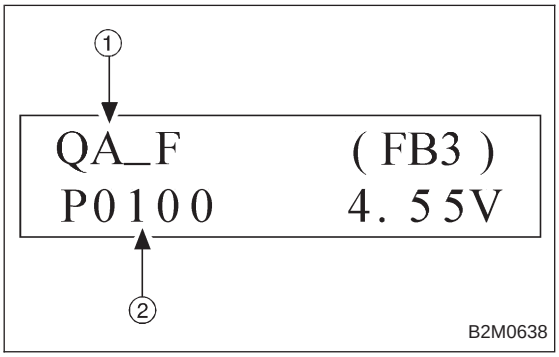


3) Ensure freeze frame data(s) is (are) shown.

(1) When no trouble is detected, or after memory is cleared.

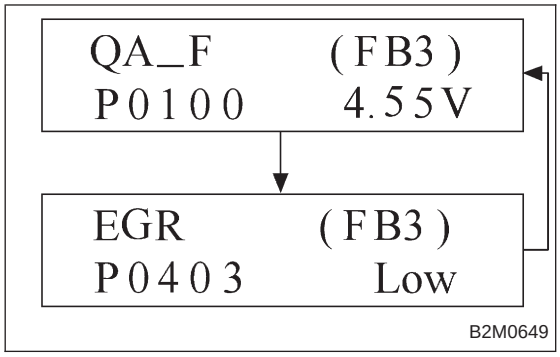


(2) When a trouble occurs but the corresponding item is not displayed.



(3) When only one trouble corresponding to the displayed item has occurred.

① Abbreviation
② Diagnostic trouble code of trouble occurred



(4) When multiple troubles corresponding to the displayed item are detected.

NOTE:
Freeze frame data is shown on display for 2 seconds at a time.

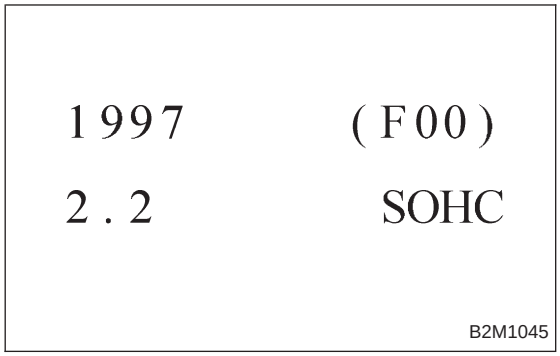
6. READ DATA FUNCTION KEY LIST FOR ENGINE

Function mode	Contents	Abbreviation	Unit of measure
F00	ROM ID number	YEAR	—
F01	Battery voltage	VB	V
F02	Vehicle speed signal	VSP	km/h, MPH
F03	Engine speed signal	EREV	rpm
F04	Engine coolant temperature signal	TW	°C, °F
F05	Ignition signal	ADVS	deg
F06	Mass air flow signal	QA	g/s, V
F07	Throttle position signal	THV	%, V
F08	Injector pulse width	TIM	mS
F09	Idle air control signal	ISC	%
F10	Load data	LOAD	%
F11	Front oxygen sensor output signal	O2	V
F12	Front oxygen sensor maximum and minimum output signal	O2max - min	V, V
F13	Rear oxygen sensor output signal	RO2	V
F14	Rear oxygen sensor maximum and minimum output signal	RO2max - min	V, V
F17	Short term fuel trim	ALPHA	%
F19	Knock sensor signal	KNOCK	deg
F20	Atmospheric absolute pressure signal	BARO. P	kPa, mmHg
F21	Intake manifold absolute pressure signal	MANI. P	kPa, mmHg
F29	A/F correction coefficient [short term trim] by rear oxygen sensor	PHOS	%
F30	Long term fuel trim [A/F learning correction coefficient]	KBLRC	%
F31	Long term fuel trim whole [A/F learning control coefficient]	K0	%
F32	Front oxygen sensor heater current	FO2H	A
F33	Rear oxygen sensor heater current	RO2H	A
F35	Purge control solenoid valve duty ratio	CPCD	%
F36	Maximum value of cylinder #1 misfire times during 100 rotations	MF1	%
F37	Maximum value of cylinder #2 misfire times during 100 rotations	MF2	%
F38	Maximum value of cylinder #3 misfire times during 100 rotations	MF3	%
F39	Maximum value of cylinder #4 misfire times during 100 rotations	MF4	%
F42	Maximum and minimum EGR system pressure value (AT vehicles)	EGRmax - min	kPa
F43	Fuel tank pressure signal	TNKP	kPa, mmHg
F44	Fuel temperature signal	TNKT	°C, °F
F45	Fuel level signal	FLEVEL	V
FA0	ON ↔ OFF signal	—	—
FA1	ON ↔ OFF signal	—	—
FA2	ON ↔ OFF signal	—	—
FA3	ON ↔ OFF signal	—	—
FA4	ON ↔ OFF signal	—	—
FA5	ON ↔ OFF signal	—	—
FB0	Diagnostic trouble code (DTC)	INSPECT	—
FB1	Diagnostic trouble code (DTC)	OBD	—

Function mode	Contents	Abbreviation	Unit of measure
FB2	Load data (Freeze frame data)	LOAD−F	%
	Engine coolant temperature signal (Freeze frame data)	TW−F	°C
	Short term fuel trim (Freeze frame data)	ALPH−F	%
	Long term fuel trim (Freeze frame data)	KBLR−F	%
	Intake manifold absolute pressure signal (Freeze frame data)	MANI−F	kPa
	Engine speed signal (Freeze frame data)	EREV−F	rpm
	Vehicle speed signal (Freeze frame data)	VSP−F	km/h
FB3	Mass air flow signal (Freeze frame data)	QA−F (P0100)	V
	Pressure signal (Freeze frame data)	PS−F (P0105)	V
	Pressure signal (Freeze frame data)	PR−F (P0106)	V
	Engine coolant temperature signal (Freeze frame data)	TW−F (P0115)	V
	Throttle position signal (Freeze frame data)	THV−F (P0120)	V
	EGR control solenoid valve signal (Freeze frame data)	EGR (P0403)	—*1
	Purge control solenoid valve signal (Freeze frame data)	CPC (P0443)	—*1
	Start switch signal (Freeze frame data)	STSW (P1100)	—*1
	Pressure sources switching solenoid valve signal (Freeze frame data)	BR1 (P1102)	—*1
	Radiator fan relay 1 signal (Freeze frame data)	FAN1 (P1500)	—*1
FC0	Clear memory	—	—
FD01	Compulsory fuel pump relay operation check	FUEL PUMP	—
FD02	Compulsory purge control solenoid valve operation check	CPC SOL	—
FD03	Compulsory radiator fan relay operation check	RAD FAN	—
FD04	Compulsory A/C relay operation check	A/C RELAY	—
FD05	Compulsory EGR control solenoid valve operation check	EGR SOL	—
FD07	Compulsory pressure control solenoid valve operation check	PCV SOL	—
FD08	Compulsory vent control solenoid valve operation check	VENT SOL	—
FD10	Compulsory pressure sources switching solenoid valve operation check	BR SOL	—

NOTE:
- Subaru select monitor is also available for monitoring information other than that used for check and repair of the vehicle.
- F42 (Maximum and minimum EGR system pressure value) will not read accurately until the EGR flow diagnosis terminates.

EGR flow diagnosis terminates when LED No. 2 illuminates at function mode FA4.
- *1: “Hi” or “Low” is shown instead of measured value.
- Because ASV solenoid valve, FICD solenoid valve and air injection system diagnosis solenoid valve are not installed, FD06, FD09 and FD11 will be displayed but non-functional.



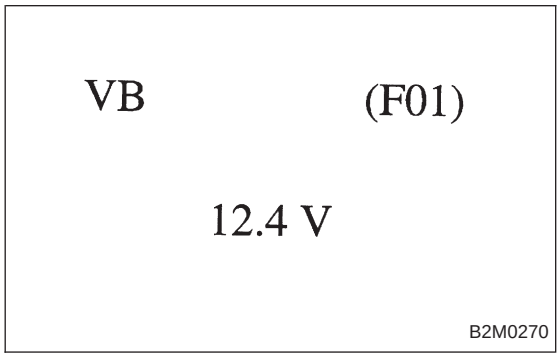
7. FUNCTION MODE: F00 — ROM ID NUMBER (YEAR) —

CONDITION:
Ignition switch “ON”

SPECIFIED DATA:
Presentation display

- Probable cause (Item outside “specified data”)

1. Error 1	Check for loose or disconnected connector, and discontinued circuit, etc.
2. Error 2	Check for poor contact of cartridge, or different type cartridge.



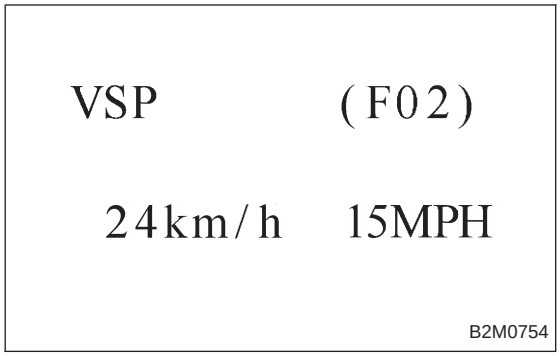
8. FUNCTION MODE: F01 — BATTERY VOLTAGE (VB) —

CONDITION:
(1) Ignition switch “ON”
(2) Idling after warm-up

SPECIFIED DATA:
(1) 11±1 V
(2) 13±1 V

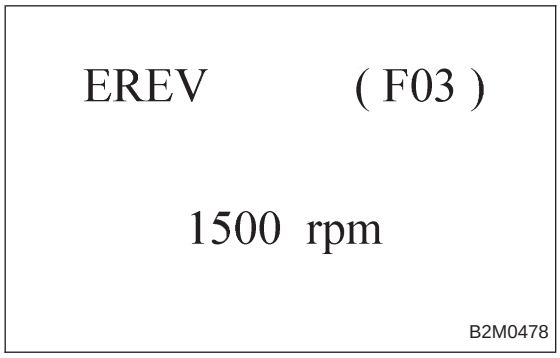
- Probable cause (Item outside “specified data”)

1. Battery	Check battery voltage and electrolyte’s specific gravity.
2. Charging system	● Check regulating voltage. (On no-load) ● Check alternator.
3. Power supply line	● Check main relay. <Ref. to 2-7 [T8C1].> ● Check harness connector of ECM power supply line. <Ref. to 2-7 [T8C2], [T8C3].>

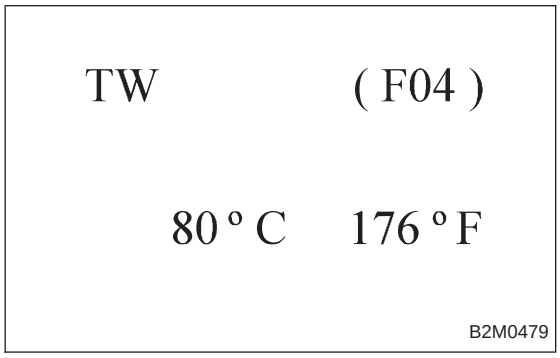


9. FUNCTION MODE: F02
— VEHICLE SPEED SIGNAL (VSP) —

- Vehicle speed is indicated in kilometer per hour (km/h) and mile per hour (MPH) at the same time.

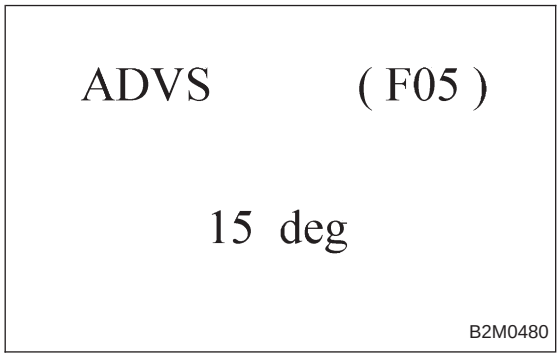


10. FUNCTION MODE: F03
— ENGINE SPEED SIGNAL (EREV) —



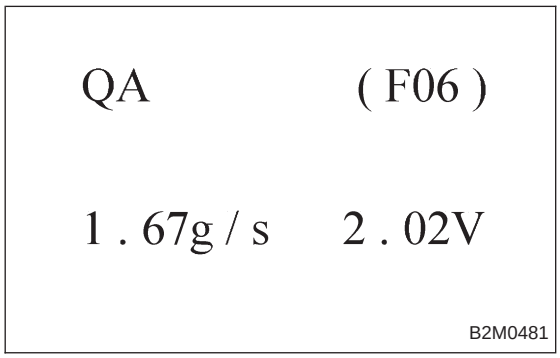
11. FUNCTION MODE: F04
— ENGINE COOLANT TEMPERATURE SIGNAL (TW) —

- Engine coolant temperature is indicated in "°C" and "°F" at the same time.



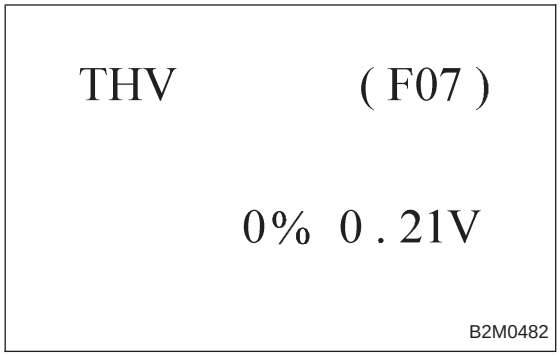
12. FUNCTION MODE: F05
— IGNITION SIGNAL (ADVS) —

NOTE:
The ignition timing value displayed in mode F05 is a value computed by ECM and will not always correspond with the value measured with a timing light.



13. FUNCTION MODE: F06
— MASS AIR FLOW SIGNAL (QA) —

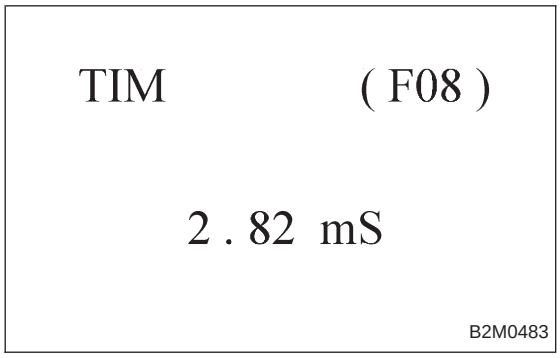
- Mass air flow and voltage input from mass air flow sensor are shown on display at the same time.



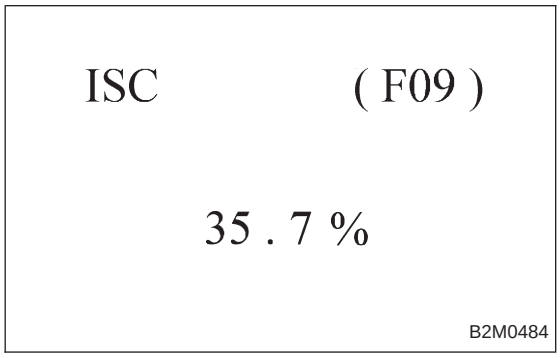
14. FUNCTION MODE: F07
— THROTTLE POSITION SIGNAL (THV) —

- Throttle position is indicated in percentage (%) and voltage (V) at the same time.

NOTE:
Be sure that the displayed value changes smoothly when changing throttle valve from fully closed to fully opened.



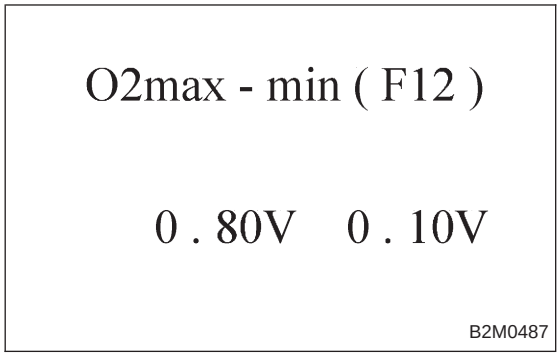
15. FUNCTION MODE: F08
— INJECTOR PULSE WIDTH (TIM) —



16. FUNCTION MODE: F09
— IDLE AIR CONTROL SIGNAL (ISC) —

17. FUNCTION MODE: F10
— LOAD DATA (LOAD) —

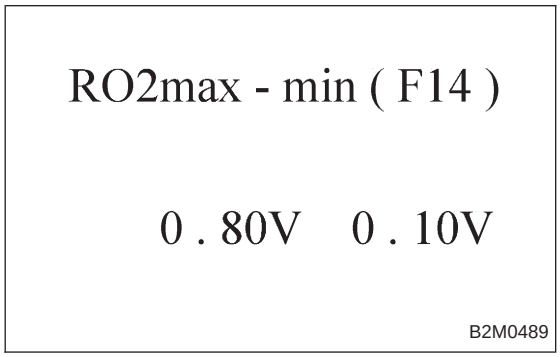
18. FUNCTION MODE: F11
— FRONT OXYGEN SENSOR OUTPUT SIGNAL (O2) —



19. FUNCTION MODE: F12
— FRONT OXYGEN SENSOR MAXIMUM AND MINIMUM OUTPUT SIGNAL (FO2MAX - MIN) —

- Front oxygen sensor maximum and minimum output signals are indicated at the same time.

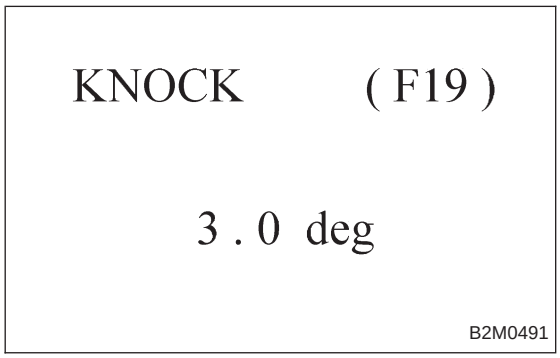
20. FUNCTION MODE: F13
— REAR OXYGEN SENSOR OUTPUT SIGNAL (RO2) —



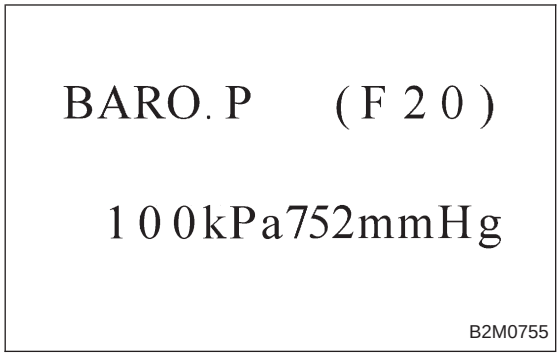
21. FUNCTION MODE: F14
— REAR OXYGEN SENSOR MAXIMUM AND MINIMUM OUTPUT SIGNAL (RO2MAX - MIN) —

- Rear oxygen sensor maximum and minimum output signals are indicated at the same time.

22. FUNCTION MODE: F17
— SHORT TERM FUEL TRIM [A/F CORRECTION COEFFICIENT] (ALPHA) —

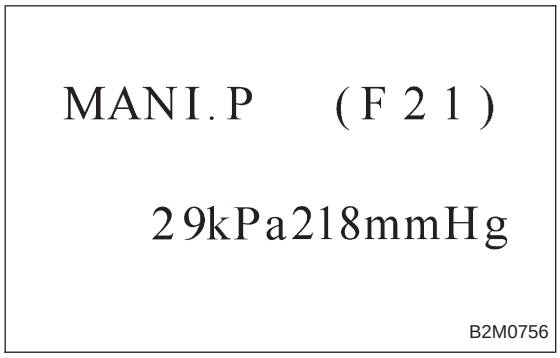


23. FUNCTION MODE: F19
— KNOCK SENSOR SIGNAL [IGNITION TIMING CORRECTION COEFFICIENT] (KNOCK) —



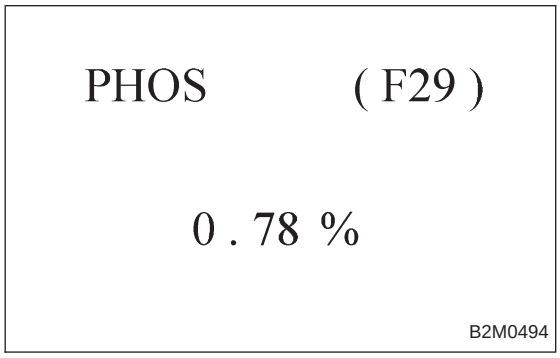
24. FUNCTION MODE: F20
— ATMOSPHERIC ABSOLUTE PRESSURE SIGNAL (BARO. P) —

- Atmospheric absolute pressure is indicated in “kPa” and “mmHg” at the same time.

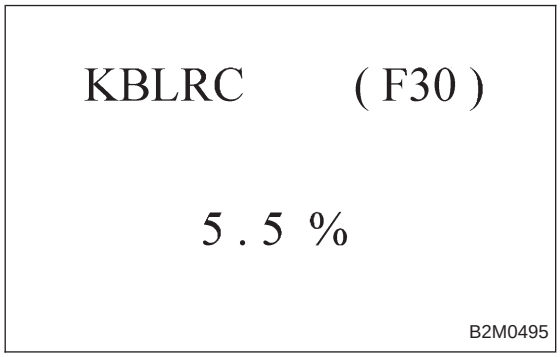


25. FUNCTION MODE: F21
— INTAKE MANIFOLD ABSOLUTE PRESSURE SIGNAL (MANI. P) —

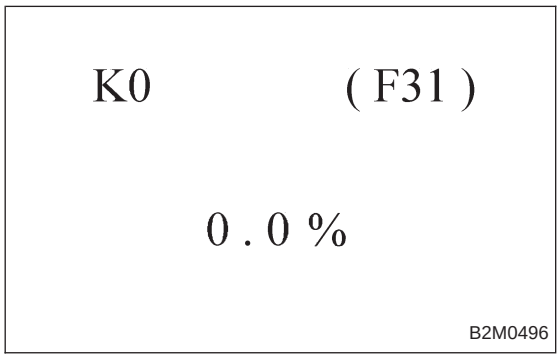
- Intake manifold absolute pressure is indicated in “kPa” and “mmHg” at the same time.



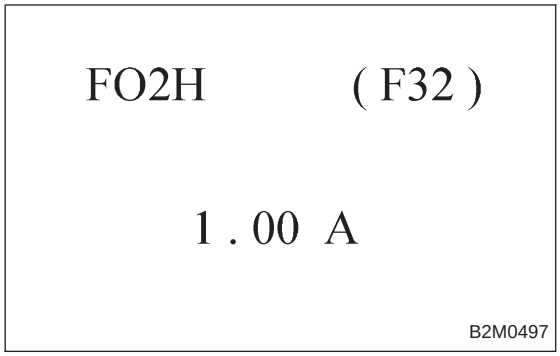
26. FUNCTION MODE: F29
— A/F CORRECTION COEFFICIENT [SHORT TERM TRIM] BY REAR OXYGEN SENSOR (PHOS) —



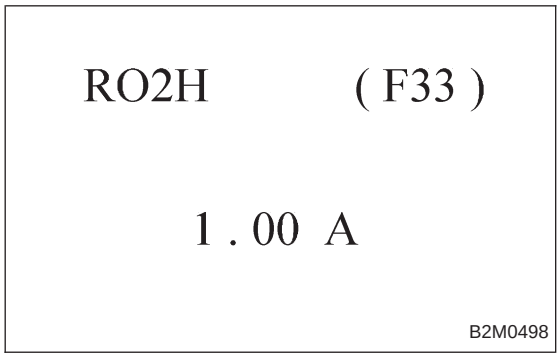
27. FUNCTION MODE: F30
— LONG TERM FUEL TRIM [A/F LEARNING CORRECTION COEFFICIENT] (KBLRC) —



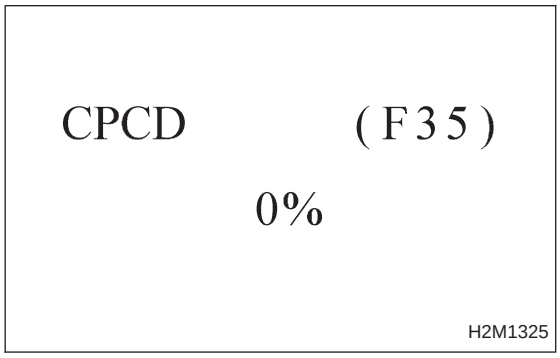
28. FUNCTION MODE: F31
— LONG TERM FUEL TRIM WHOLE [A/F LEARNING CONTROL COEFFICIENT] (K0) —



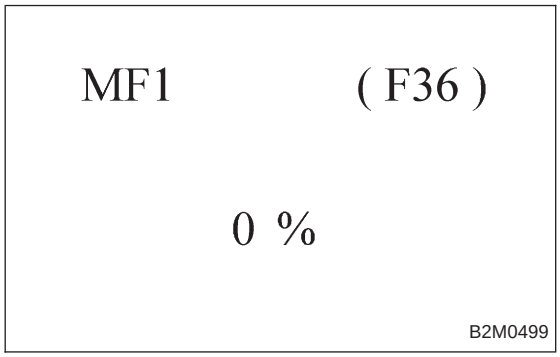
29. FUNCTION MODE: F32
— FRONT OXYGEN SENSOR HEATER CURRENT (FO2H) —



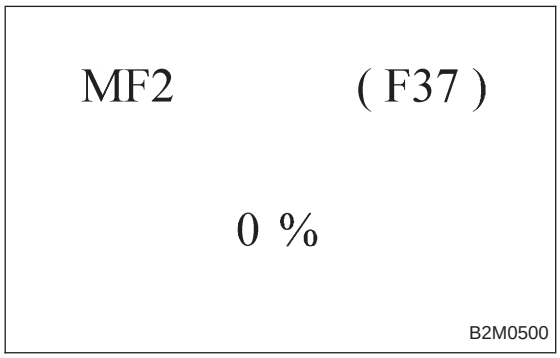
30. FUNCTION MODE: F33
— REAR OXYGEN SENSOR HEATER CURRENT (RO2H) —



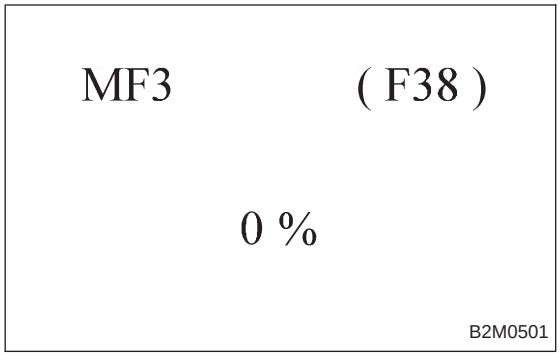
31. FUNCTION MODE: F35
— PURGE CONTROL SOLENOID VALVE DUTY RATIO (CPCD) —



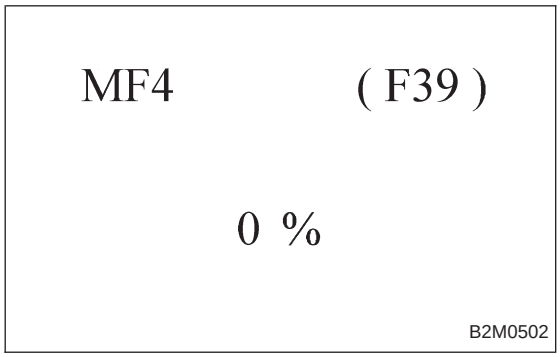
32. FUNCTION MODE: F36
— MAXIMUM VALUE OF CYLINDER #1 MISFIRE RATE DURING 100 ROTATIONS (MF1) —



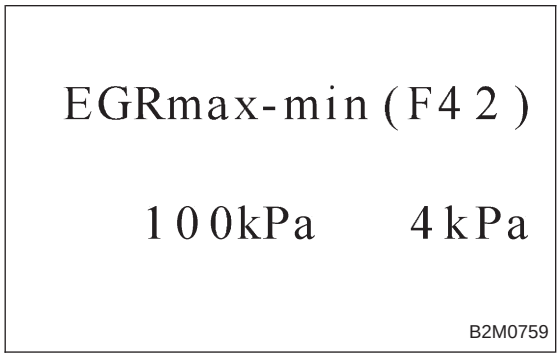
33. FUNCTION MODE: F37
— MAXIMUM VALUE OF CYLINDER #2 MISFIRE RATE DURING 100 ROTATIONS (MF2) —



34. FUNCTION MODE: F38
— MAXIMUM VALUE OF CYLINDER #3 MISFIRE RATE DURING 100 ROTATIONS (MF3) —

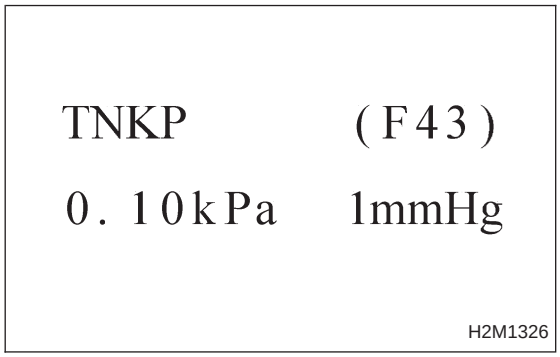


35. FUNCTION MODE: F39
— MAXIMUM VALUE OF CYLINDER #4 MISFIRE RATE DURING 100 ROTATIONS (MF4) —

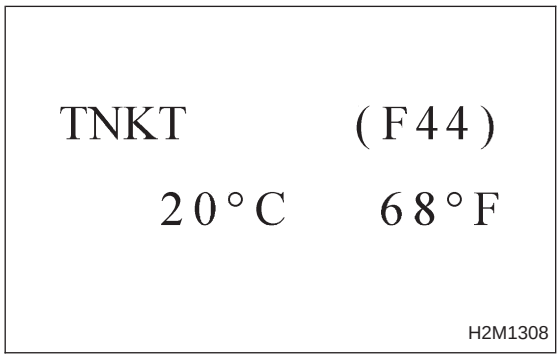


36. FUNCTION MODE: F42
— MAXIMUM AND MINIMUM EGR SYSTEM PRESSURE VALUE [AT VEHICLES] (EGRMAX-MIN) —

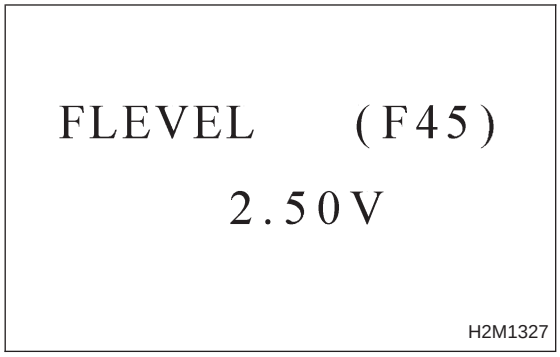
- Maximum and minimum EGR system pressure value are indicated at the same time.



37. FUNCTION MODE: F43
— FUEL TANK PRESSURE SIGNAL (TNKP) —



38. FUNCTION MODE: F44
— FUEL TEMPERATURE SIGNAL (TNKT) —



39. FUNCTION MODE: F45
— FUEL LEVEL SIGNAL (FLEVEL) —

40. FA MODE FOR ENGINE

Function mode	LED No.	Contents	Display	LED “ON” requirements
FA0	3	Neutral switch	NT	When neutral position signal is entered.
	7	Test mode connector	UD	When test mode connector is connected.
	8	AT/MT identification signal	AT	When AT identification signal is entered.
	9	Ignition switch	IG	When ignition switch is turned ON.
FA1	1	Radiator fan relay 2	R2	When radiator fan relay 2 is in function.
	2	Knock signal	KS	When knock signal is entered.
	3	Purge control solenoid valve	CN	When purge control solenoid valve is in function.
	4	Fuel pump relay	FP	When fuel pump relay is in function.
	6	Radiator fan relay 1	R1	When radiator fan relay 1 is in function.
	7	Air conditioner relay	AR	When air conditioner relay is in function.
	8	Air conditioner switch	AC	When air conditioner switch is turned ON.
FA2	2	AEC signal	EC	When AEC signal is entered.
	3	EAM signal	AM	When EAM signal is gone out.
	4	AEB signal	EB	When AEB signal is entered.
	6	AET signal	ET	When AET signal is entered.
	7	Engine torque control signal	TR	When engine torque control signal is entered.
FA3	7	Pressure sources switching solenoid valve	BR	When pressure sources switching solenoid valve is in function.
FA4	1	Catalyst	CA	When diagnosis of catalyzer is finished.
	2	EGR system	E1	When diagnosis of EGR system is finished.
	3	California spec. vehicle identification signal	FC	When Federal spec. vehicle identification signal is entered.
	8	Rear oxygen sensor signal	OR	When rear oxygen sensor mixture ratio is rich.
	9	Front oxygen sensor signal	O2	When front oxygen sensor mixture ratio is rich.
FA5	6	Vent control solenoid valve	AL	When vent control solenoid valve is in function.
	7	EGR solenoid valve	ER	When EGR solenoid valve is in function.
	8	Pressure control solenoid valve	PC	When pressure control solenoid valve is in function.

LED No.	Signal name	Display
1	—	—
2	—	—
3	Neutral switch	NT
4	—	—
5	—	—
6	—	—
7	Test mode connector	UD
8	Identification of AT model	AT
9	Ignition switch	IG
0	—	—

—	—	NT	—	—
—	UD	AT	IG	—
1	2	3	4	5
6	7	8	9	0

41. FUNCTION MODE: FA0

— ON ↔ OFF SIGNAL —

Requirement for LED “ON”.
LED No. 3 ● On MT model, gear position is in neutral.
● On AT model, shift position is in “P” or “N”.
LED No. 7 Test mode connector is connected.
LED No. 8 Vehicle is AT model.
LED No. 9 Ignition switch is turned ON.

LED No.	Signal name	Display
1	Radiator fan relay 2	R2
2	Knock signal	KS
3	Purge control solenoid valve	CN
4	Fuel pump relay	FP
5	—	—
6	Radiator fan relay 1	R1
7	A/C relay	AR
8	A/C switch	AC
9	—	—
0	—	—

R2	KS	CN	FP	—
R1	AR	AC	—	—
1	2	3	4	5
6	7	8	9	0

42. FUNCTION MODE: FA1

— ON ↔ OFF SIGNAL —

Requirement for LED “ON”.
LED No. 1 Radiator fan relay 2 is turned ON.
LED No. 2 Engine is knocking.
LED No. 3 Purge control solenoid valve is in function.
LED No. 4 Fuel pump relay is turned ON.
LED No. 6 Radiator fan relay 1 is turned ON.
LED No. 7 A/C relay is turned ON.
LED No. 8 A/C switch is turned ON.

NOTE:
● When LED No. 1, 3, 4, 6 and 7 blinks with the test mode connector connected and the ignition switch turned to ON, the corresponding part is functioning properly.
● When LED No. 4 illuminates for only 2 seconds after the ignition switch is turned to ON, (and then goes out), the corresponding part is functioning properly.
● LED No. 3 is applicable only to the models not equipped with enhanced evaporative emission control system.

LED No.	Signal name	Display
1	—	—
2	AEC signal	EC
3	EAM signal	AM
4	AEB signal	EB
5	—	—
6	AET signal	ET
7	Engine torque control signal	TR
8	—	—
9	—	—
0	—	—

—	EC	AM	EB	—
ET	TR	—	—	—

1	2	3	4	5
6	7	8	9	0

43. FUNCTION MODE: FA2

— ON ↔ OFF SIGNAL —

Requirement for LED “ON”.

LED No. 2 ECM entered the AEC signal emitted from TCS C/M.
LED No. 3 EAM signal goes out.
LED No. 4 ECM entered the AEB signal emitted from TCS C/M.
LED No. 6 ECM entered the AET signal emitted from TCS C/M.
LED No. 7 ECM entered the torque control signal emitted from TCM.

LED No.	Signal name	Display
1	—	—
2	—	—
3	—	—
4	—	—
5	—	—
6	—	—
7	Pressure sources switching solenoid valve	BR
8	—	—
9	—	—
0	—	—

—	—	—	—	—
—	BR	—	—	—

1	2	3	4	5
6	7	8	9	0

44. FUNCTION MODE: FA3

— ON ↔ OFF SIGNAL —

Requirement for LED “ON”.

LED No. 7 Pressure sources switching solenoid valve is in function.

NOTE:
When LED No. 7 blinks with the test mode connector connected and the ignition switch turned to ON, the corresponding part is functioning properly.

LED No.	Signal name	Display
1	Catalyst	CA
2	EGR system	E1
3	California model identification signal	FC
4	—	—
5	—	—
6	—	—
7	—	—
8	Rear oxygen sensor signal	OR
9	Front oxygen sensor signal	O2
0	—	—

CA	E1	FC	—	—
—	—	OR	O2	—

1	2	3	4	5
6	7	8	9	0

45. FUNCTION MODE: FA4

— ON ↔ OFF SIGNAL —

Requirement for LED “ON”.
LED No. 1 Diagnosis of catalyzer is finished.
LED No. 2 Diagnosis of EGR system is finished.
LED No. 3 Vehicle is Federal specifications.
LED No. 8 Rear oxygen sensor mixture ratio is rich.
LED No. 9 Front oxygen sensor mixture ratio is rich.

LED No.	Signal name	Display
1	—	—
2	—	—
3	—	—
4	—	—
5	—	—
6	Vent control solenoid valve	AL
7	EGR solenoid valve	ER
8	Pressure control solenoid valve	PC
9	—	—
0	—	—

—	—	—	—	—
AL	ER	PC	—	—

1	2	3	4	5
6	7	8	9	0

46. FUNCTION MODE: FA5

— ON ↔ OFF SIGNAL —

Requirement for LED “ON”.
LED No. 6 Vent control solenoid valve is in function.
LED No. 7 EGR solenoid valve is in function.
LED No. 8 Pressure control solenoid valve is in function.

NOTE:
When LED No. 6, 7 and 8 blinks with the test mode connector connected and the ignition switch turned to ON, the corresponding part is functioning properly.

47. FB MODE FOR ENGINE

Function mode	Abbreviation	Contents	Contents of display	Page
FB0	INSPECT	On-board diagnostics (Inspection)	Current trouble code indicated by on-board diagnostics after clear memory.	65 <Ref. to 2-7 [T3E0].>
FB1	OBD	On-board diagnostics (Read data)	Current trouble code indicated by on-board diagnostics.	37 <Ref. to 2-7 [T3C2].>
FB2	LOAD−F	Load data	● Freeze frame data ● Data stored at the time of trouble occurrence, is shown on display.	38 <Ref. to 2-7 [T3C4].>
	TW−F	Engine coolant temperature signal		
	ALPH−F	Throttle position signal		
	KBLR−F	Long term fuel trim		
	MANI−F	Intake manifold absolute pressure signal		
	EREV−F	Engine speed signal		
	VSP−F	Vehicle speed signal		
FB3	QA−F (P0100)	Mass air flow signal	● Freeze frame data ● Data stored at the time of trouble occurrence, is shown on display.	40 <Ref. to 2-7 [T3C5].>
	PS−F (P0105)	Pressure signal		
	PR−F (P0106)	Pressure signal		
	TW−F (P0115)	Engine coolant temperature signal		
	THV−F (P0120)	Throttle position signal		
	EGR (P0403)	EGR control solenoid valve signal		
	CPC (P0443)	Purge control solenoid valve signal		
	STSW (P1100)	Start switch signal		
	BR1 (P1102)	Pressure sources switching solenoid valve signal		
	FAN1 (P1500)	Radiator fan relay 1 signal		

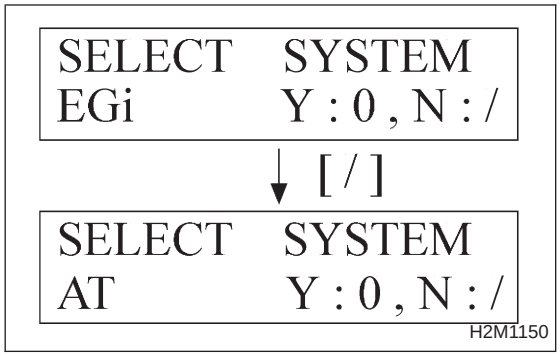
48. FC MODE FOR ENGINE

Function mode	Abbreviation	Contents	Contents of display	Page
FC0	MEMORY CLR	Back-up memory clear	Function of clearing trouble code stored in memory.	64 <Ref. to 2-7 [T3D0].>

49. FD MODE FOR ENGINE

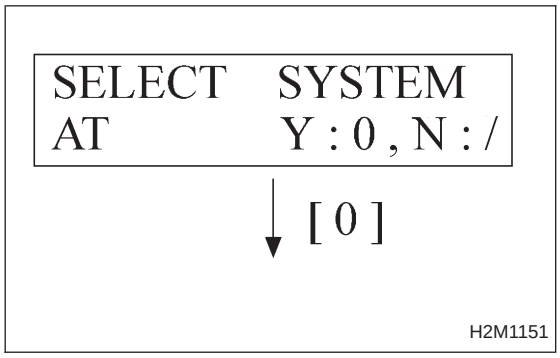
Function mode	Abbreviation	Contents	Contents of display	Page
FD01	FUEL PUMP	Compulsory valve operation check	Function of checking operation of fuel pump relay, purge control solenoid valve, radiator fan relay, A/C relay, EGR control solenoid valve, pressure control solenoid valve, vent control solenoid valve and pressure sources switching solenoid valve.	71 <Ref. to 2-7 [T3F0].>
FD02	CPC SOL			
FD03	RAD FAN			
FD04	A/C RELAY			
FD05	EGR SOL			
FD07	PCV SOL			
FD08	VENT SOL			
FD10	BR SOL			

NOTE:
Because ASV solenoid valve, FICD solenoid valve and air injection system diagnosis solenoid valve are not installed, FD06, FD09 and FD11 will be displayed but non-functional.

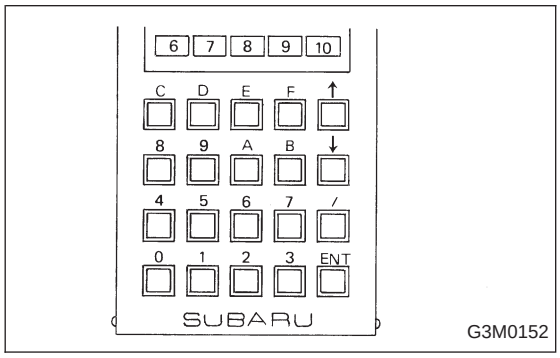


50. READ CURRENT DATA SHOWN ON DISPLAY FOR AT. (FUNCTION MODE)

1) Select AT mode using function key.
Press the function key [/], and change to AT mode.



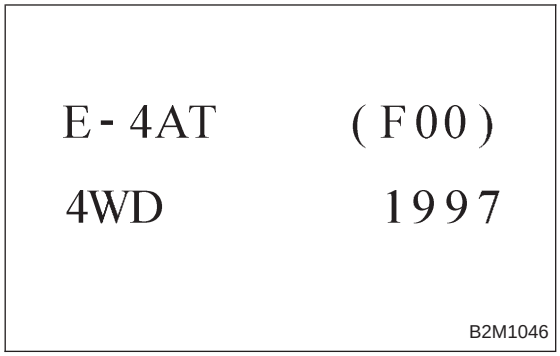
2) Press the function key [0].



3) Designate mode using function key.
<Ref. to 2-7 [T3C51].>
(Example: Press [F] [0] [2] [ENT] in that order.)
4) Ensure data of input or output signal is shown.

51. READ DATA FUNCTION KEY LIST FOR AT

Function mode	Contents	Abbr.	Unit
F00	Mode display	E-4AT	—
F01	Battery voltage	VB	V
F02	Vehicle speed sensor 1 signal	VSP1	m/h
F03	Vehicle speed sensor 1 signal	VSP1	km/h
F04	Vehicle speed sensor 2 signal	VSP2	m/h
F05	Vehicle speed sensor 2 signal	VSP2	km/h
F06	Engine speed	EREV	rpm
F07	ATF temperature sensor signal	ATFT	deg F
F08	ATF temperature sensor signal	ATFT	deg C
F09	Throttle position sensor signal	THV	V
F10	Gear position	GEAR	—
F11	Line pressure duty ratio	PLDTY	%
F12	Lock-up duty ratio	LUDTY	%
F13	AWD duty ratio	4WDTY	%
F14	Throttle position sensor power supply voltage	THVCC	V
F15	Mass air flow sensor signal	AFM	V



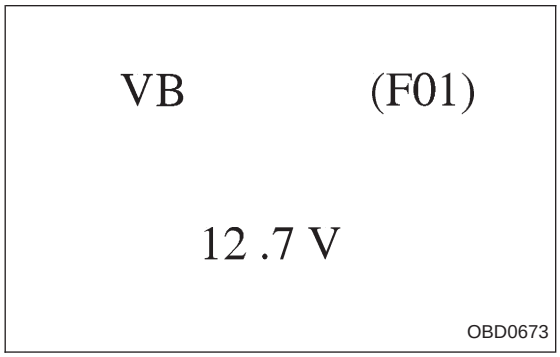
52. FUNCTION MODE: F00 — MODE DISPLAY —

SPECIFIED DATA:

Data at the left should be indicated.

Probable cause (if outside “specified data”)

1. Communication failure (No communication method can be confirmed with power ON.)	(1)	Check loose or poor connectors, or shortcircuit.
	(2)	Check type of cartridge.
2. Vehicle types cannot be identified (due to communication failure).		Check improper cartridge. Replace with proper one.



53. FUNCTION MODE: F01 — BATTERY VOLTAGE (VB) —

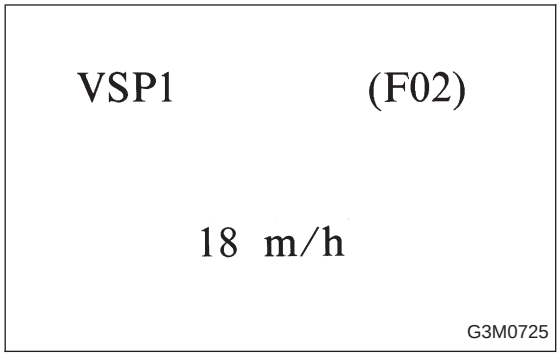
CONDITION:

(1) Ignition switch ON
(2) Engine idling after warm-up

SPECIFIED DATA:

(1) 12±1 V
(2) 13±1 V

1. Battery		Check battery voltage and specific gravity of electrolyte.
2. Charging system	(1)	Measure regulating voltage under no loads.
	(2)	Check generator (as a single unit).

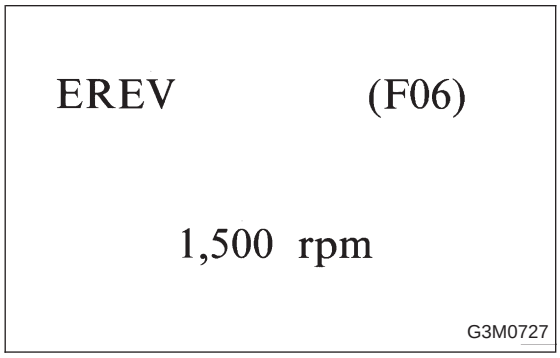


54. FUNCTION MODE: F02
— VEHICLE SPEED SENSOR 1 SIGNAL (VSP1) —

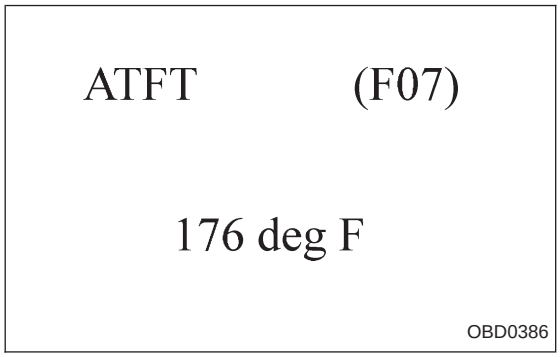
- F02: Vehicle speed is indicated in mile per hour (m/h).
- F03: Vehicle speed is indicated in kilometer per hour (km/h).

55. FUNCTION MODE: F04
— VEHICLE SPEED SENSOR 2 SIGNAL (VSP2) —

- F04: Vehicle speed is indicated in mile per hour (m/h).
- F05: Vehicle speed is indicated in kilometer per hour (km/h).

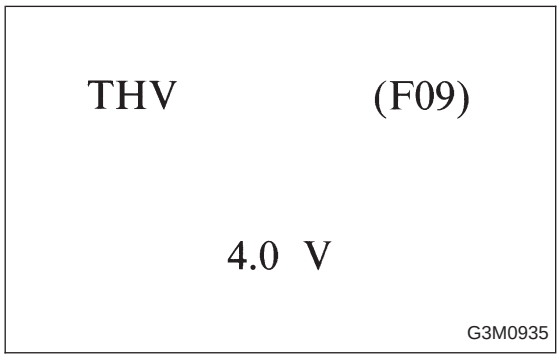


56. FUNCTION MODE: F06
— ENGINE SPEED (EREV) —

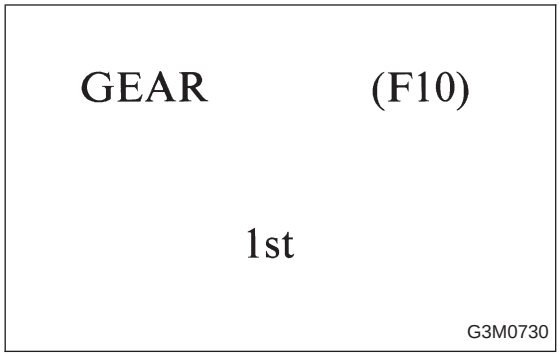


57. FUNCTION MODE: F07
— ATF TEMPERATURE SENSOR SIGNAL (ATFT) —

- F07: ATF temperature is indicated in “deg F”.
- F08: ATF temperature is indicated in “deg C”.

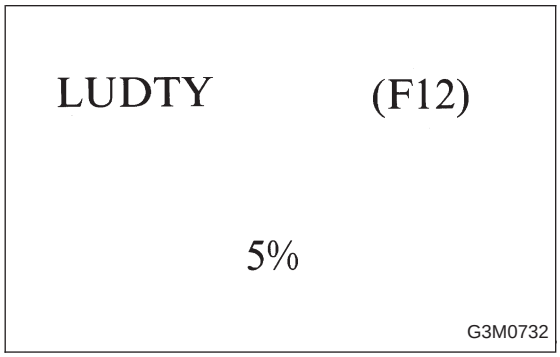


58. FUNCTION MODE: F09
— THROTTLE POSITION SENSOR SIGNAL (THV) —

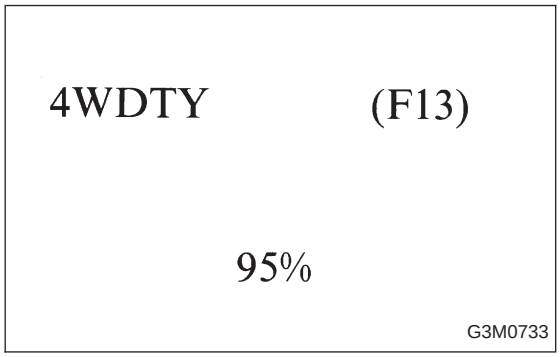


59. FUNCTION MODE: F10
— GEAR POSITION (GEAR) —

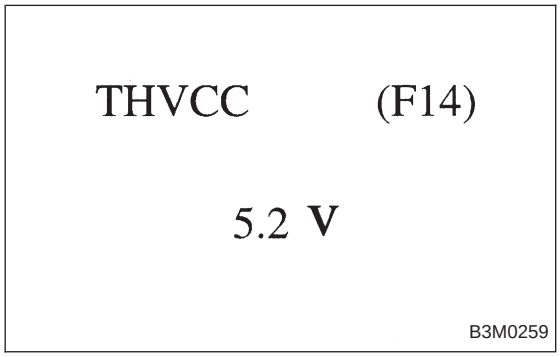
60. FUNCTION MODE: F11
— LINE PRESSURE DUTY RATIO (PLDTY) —



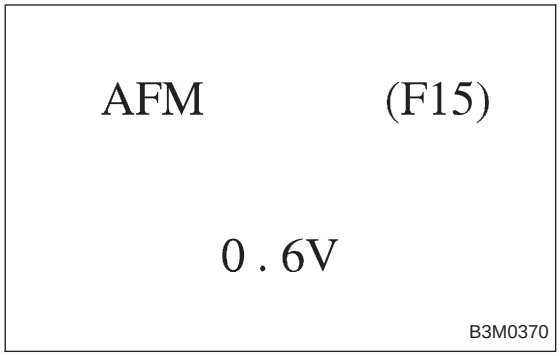
61. FUNCTION MODE: F12
— LOCK-UP DUTY RATIO (LUDTY) —



62. FUNCTION MODE: F13
— AWD DUTY RATIO (4WDTY) —



63. FUNCTION MODE: F14
— THROTTLE POSITION SENSOR POWER SUPPLY VOLTAGE (THVCC) —



64. FUNCTION MODE: F15
— MASS AIR FLOW SENSOR SIGNAL (AFM) —

LED No.	Signal name	Display
1	FWD switch	FF
2	Kick-down switch	KD
3	—	—
4	—	—
5	Brake switch	BR
6	ABS switch	AB
7	Cruise control set	CR
8	Power switch	PW
9	—	—
10	—	—

FF	KD	—	—	BR
AB	CR	PW	—	—

1	2	3	4	5
6	7	8	9	10

65. FUNCTION MODE: FA0

— ON ↔ OFF SIGNAL —

Requirement for LED “ON”.
LED No. 1 Fuse is installed in FWD switch.
LED No. 2 Kick-down switch is turned ON. (Europe and General models only)
LED No. 5 Brake pedal is depressed.
LED No. 6 ABS signal is entered.
LED No. 7 Cruise control is set.
LED No. 8 Power switch is turned ON. (Europe and General models only)

LED No.	Signal name	Display
1	N/P range switch	NP
2	R range switch	RR
3	D range switch	RD
4	3 range switch	R3
5	2 range switch	R2
6	1 range switch	R1
7	Diagnosis switch	SS
8	—	—
9	—	—
10	—	—

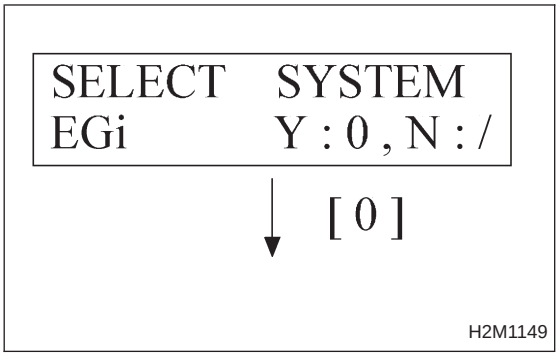
NP	RR	RD	R3	R2
R1	SS	—	—	—

1	2	3	4	5
6	7	8	9	10

66. FUNCTION MODE: FA1

— ON ↔ OFF SIGNAL —

Requirement for LED “ON”.
LED No. 1 “N” or “P” range is selected.
LED No. 2 “R” range is selected.
LED No. 3 “D” range is selected.
LED No. 4 “3” range is selected.
LED No. 5 “2” range is selected.
LED No. 6 “1” range is selected.
LED No. 7 Diagnosis connector is connected.



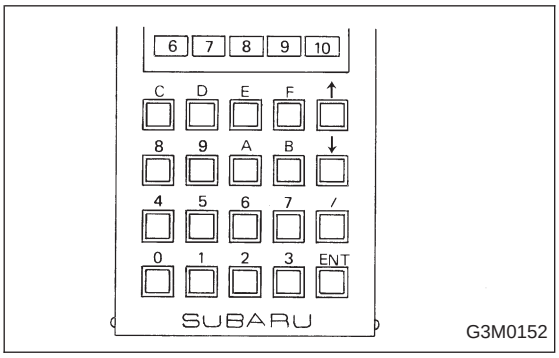
D: CLEAR MEMORY MODE

1. SUBARU SELECT MONTOR

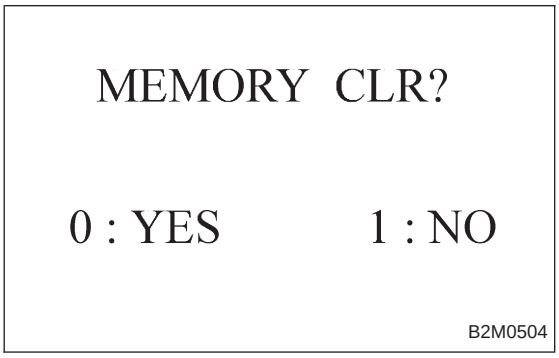
1) Select engine mode or AT mode using function key.
- Engine mode:

Press the function key [0].
- AT mode:

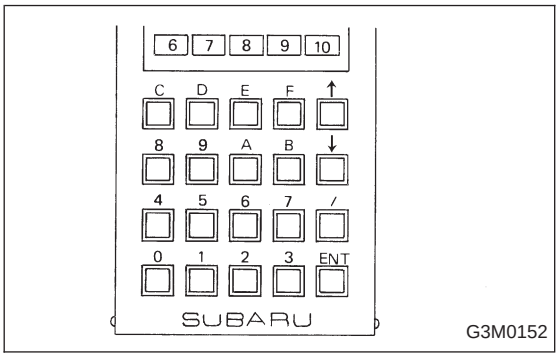
Press the function key [/] [0] in that order.



2) Designate mode using function key.
Press [F] [C] [0] [ENT] in that order.



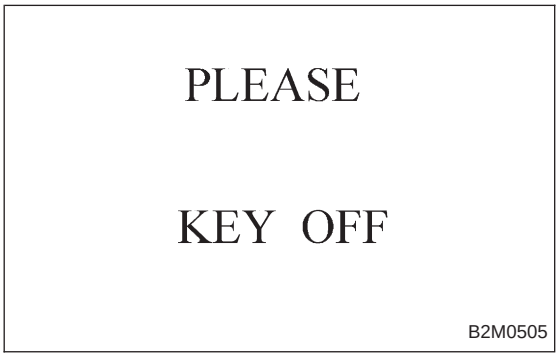
3) Ensure displayed message.



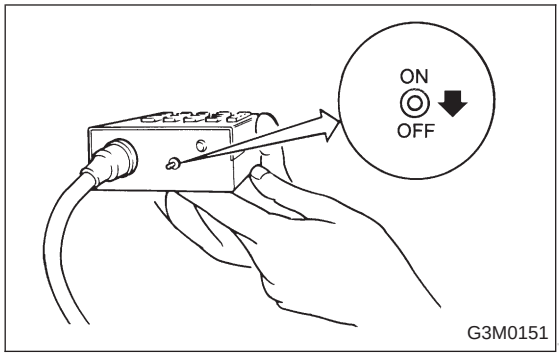
4) Press function key.
- When executing, (YES)

Press [0] [ENT] in that order.
- When not executing, (NO)

Press [1] [ENT] in that order.



5) When executed, the indication as shown here appears for approximately four seconds, and the past trouble history is deleted.

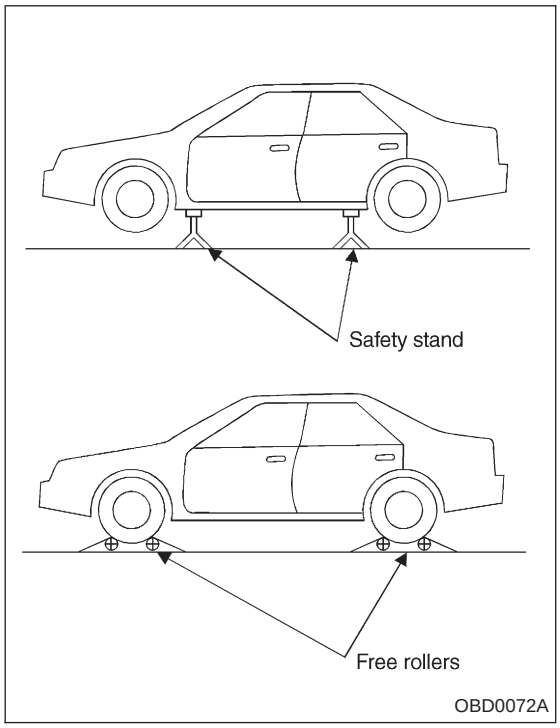


6) After the display is gone, turn Subaru select monitor switch and ignition switch to OFF.

NOTE:
When the ECM, battery terminals, etc. are disconnected after memory is cleared, idling speed may increase. This is not considered a problem because the ISC valve duty controlled learning value has been cleared. To return the engine to idling speed, idle for approximately 2 minutes with air conditioner off.

2. OBD-II GENERAL SCAN TOOL

For clear memory procedures using the OBD-II general scan tool, refer to the OBD-II General Scan Tool Instruction Manual.



E: INSPECTION MODE

1. PREPARATIONS FOR THE INSPECTION MODE

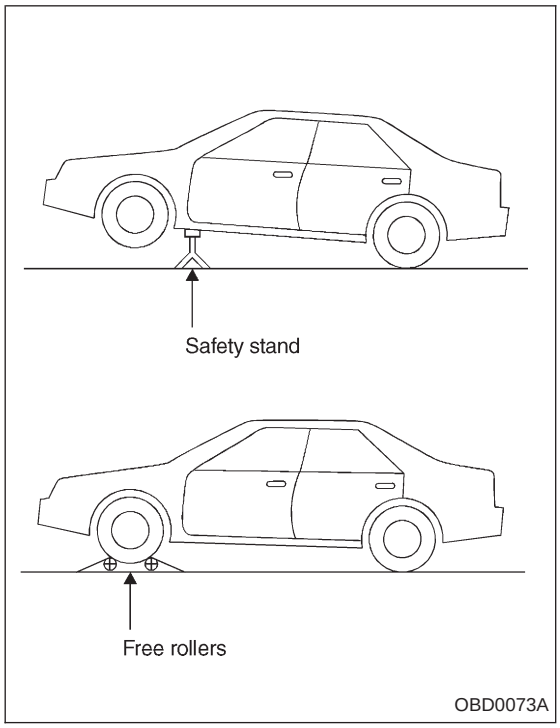
Raise the vehicle using a garage jack and place on safety stands or drive the vehicle onto free rollers.

- **FULL-TIME AWD MODELS**

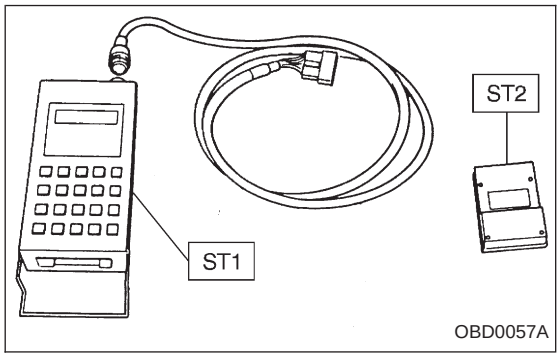
WARNING:

- **Before raising the vehicle, ensure parking brakes are applied.**
- **Do not use a pantograph jack in place of a safety stand.**
- **Secure a rope or wire to the front and rear towing or tie-down hooks to prevent the lateral runout of front wheels.**
- **Do not abruptly depress/release clutch pedal or accelerator pedal during works even when engine is operating at low speeds since this may cause vehicle to jump off free rollers.**
- **In order to prevent the vehicle from slipping due to vibration, do not place any wooden blocks or similar items between the safety stands and the vehicle.**

● Since the rear wheels will also rotate, do not place anything near them. Also, make sure that nobody goes in front of the vehicle.

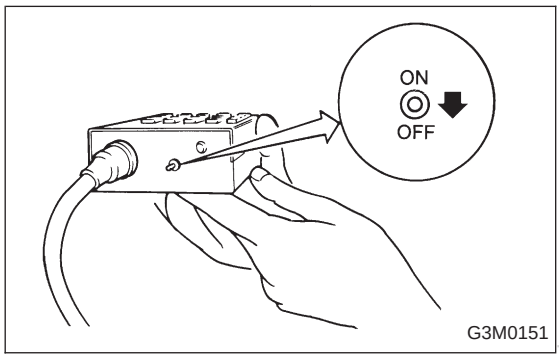


● FWD MODELS
WARNING:
● Before raising the vehicle, ensure parking brakes are applied.
● Do not use a pantograph jack in place of a safety stand.
● If only the front wheels are raised or placed on a free roller, apply parking brakes and lock the rear wheels.
● Secure a rope or wire to the front and rear towing or tie-down hooks to prevent the lateral runout of front wheels.
● Do not abruptly depress/release clutch pedal or accelerator pedal during works even when engine is operating at low speeds since this may cause vehicle to jump off free rollers.
● In order to prevent the vehicle from slipping due to vibration, do not place any wooden blocks or similar items between the safety stands and the vehicle.
● Since the rear wheels will also rotate, do not place anything near them. Also, make sure that nobody goes in front of the vehicle.

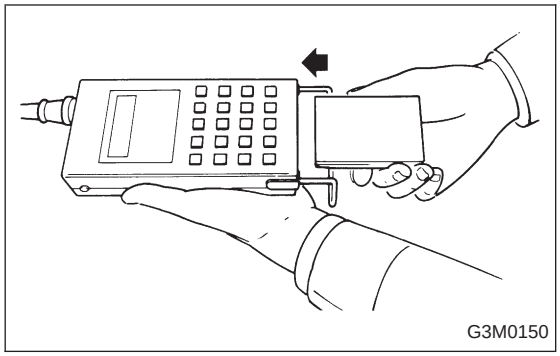


2. SUBARU SELECT MONITOR

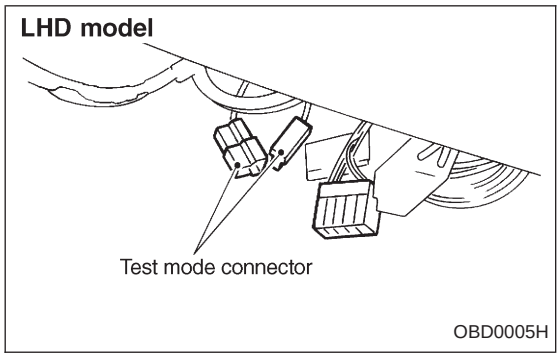
After performing diagnostics and clearing the memory, check for any remaining unresolved trouble data.
1) Prepare Subaru select monitor and cartridge.
ST1 498307500 SELECT MONITOR KIT
ST2 498346300 CARTRIDGE



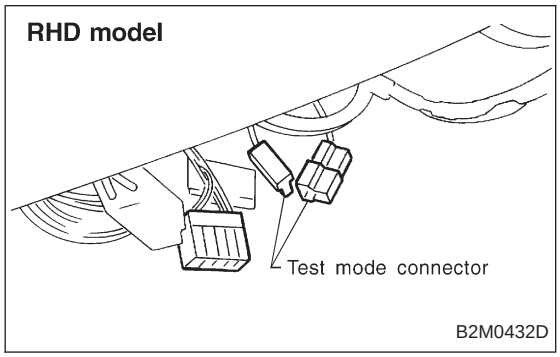
2) Turn ignition switch and Subaru select monitor switch to OFF.

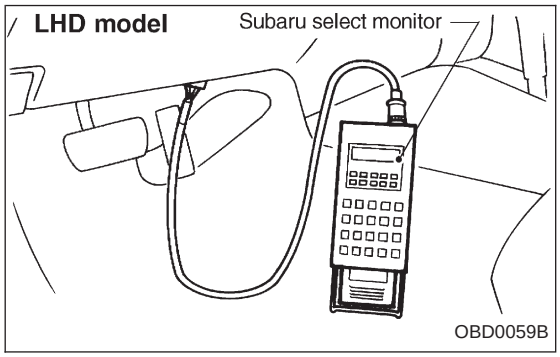

G3M0150

3) Insert cartridge into Subaru select monitor.

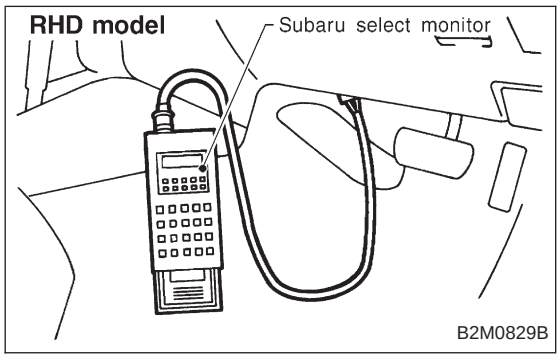


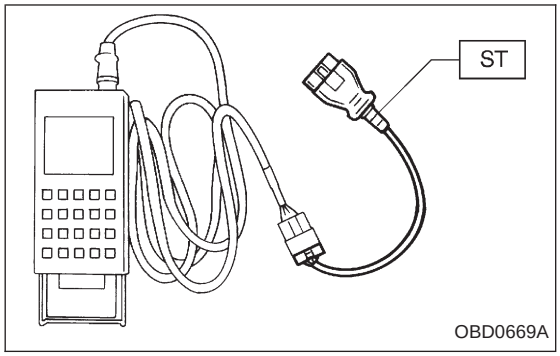
4) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.





5) Connect Subaru select monitor to data link connector.
● Using data link connector for Subaru select monitor only:
Connect Subaru select monitor to its data link connector located in the lower portion of the instrument panel (on the driver's side), to the side of the center console box.

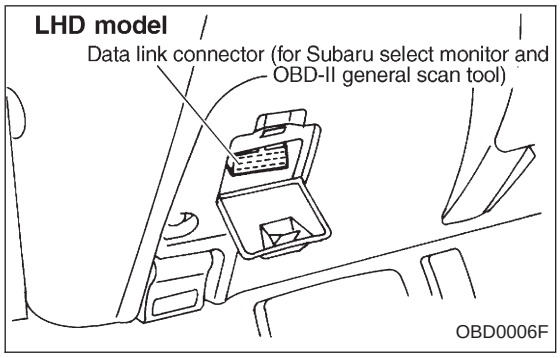




● Using data link connector for Subaru select monitor and OBD-II general scan tool:

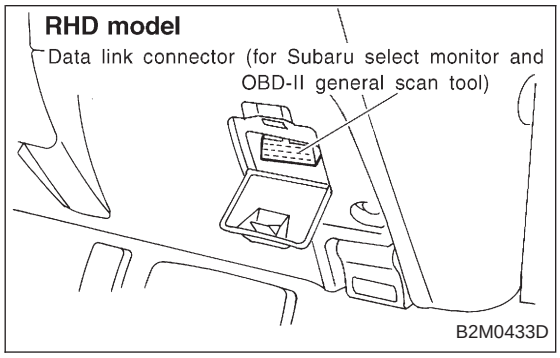
(1) Connect ST to Subaru select monitor cable.

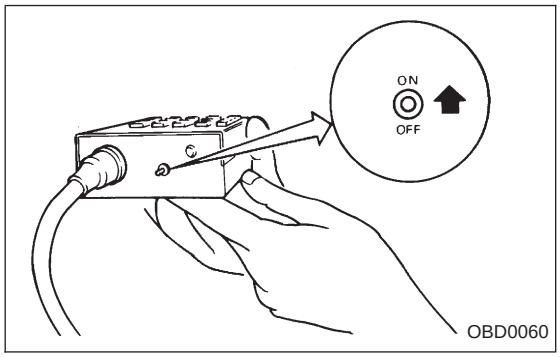
ST 498357200 ADAPTER CABLE



(2) Open the cover and connect Subaru select monitor to data link connector located in the lower portion of the instrument panel (on the driver's side), to the lower cover.

CAUTION:
Do not connect scan tools except for Subaru select monitor and OBD-II general scan tool.





6) Turn ignition switch to ON (engine OFF) and Subaru select monitor switch to ON.

7) Start the engine.

NOTE:
● Ensure the selector lever is placed in the "P" position before starting. (AT vehicles)
● Depress clutch pedal when starting the engine. (MT vehicles)

8) Using the selector lever or shift lever, turn the "P" position switch and the "N" position switch to ON.

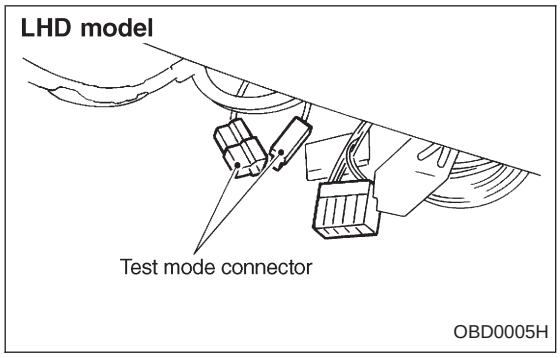
9) Depress the brake pedal to turn the brake switch ON. (AT vehicles)

10) Keep engine speed in the 2,500 — 3,000 rpm range for 40 seconds.

NOTE:
On models without tachometer, use the Subaru select monitor or tachometer (Secondary pickup type).

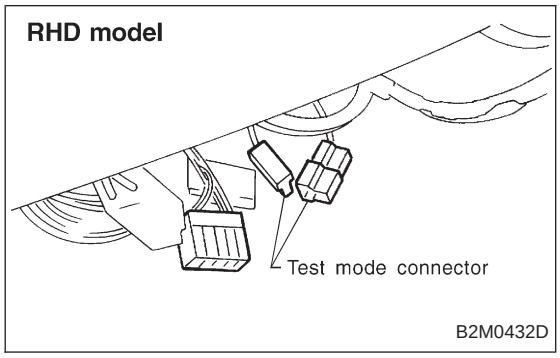
11) Place the selector lever or shift lever in the "D" position (AT vehicles) or "1st" gear (MT vehicles) and drive the vehicle at 5 to 10 km/h (3 to 6 MPH).

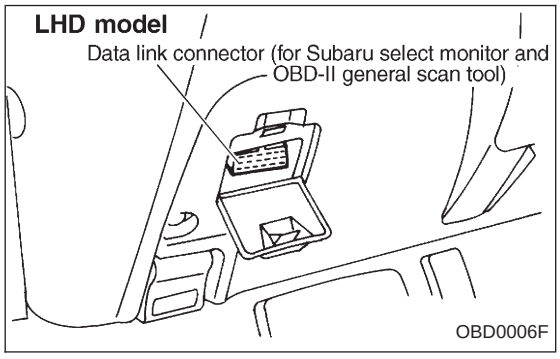
NOTE:
- On AWD vehicles, release the parking brake.
- The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system. <Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>



3. OBD-II GENERAL SCAN TOOL

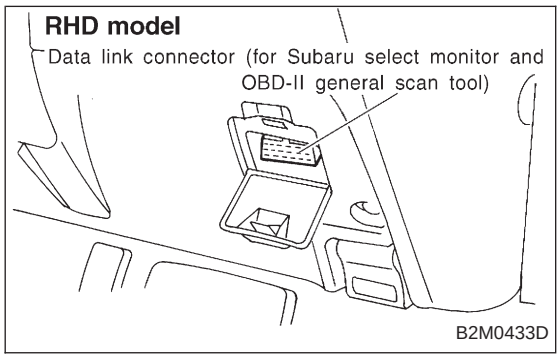
After performing diagnostics and clearing the memory, check for any remaining unresolved trouble data:
1) Connect test mode connector at the lower side of the instrument panel (on the driver's side), to the side of the center console box.





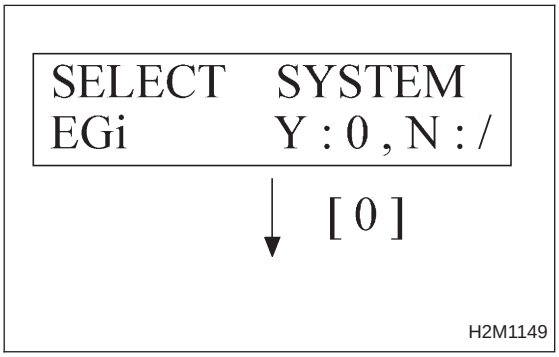
2) Open the cover and connect the OBD-II general scan tool to its data link connector in the lower portion of the instrument panel (on the driver's side), to the lower cover.

CAUTION:
Do not connect the scan tools except for Subaru select monitor and OBD-II general scan tool.



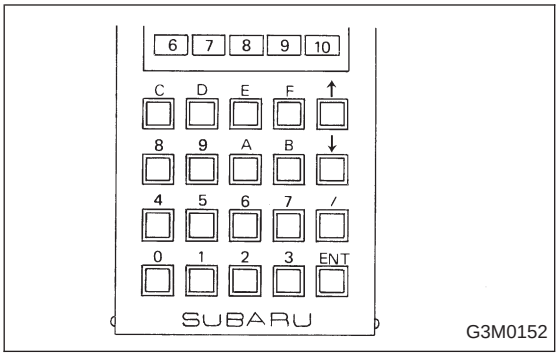
3) Start the engine.
NOTE:
● Ensure the selector lever is placed in the “P” position before starting. (AT vehicles)
● Depress clutch pedal when starting the engine. (MT vehicles)
4) Using the selector lever or shift lever, turn the “P” position switch and the “N” position switch to ON.
5) Depress the brake pedal to turn the brake switch ON. (AT vehicles)
6) Keep engine speed in the 2,500 — 3,000 rpm range for 40 seconds.
NOTE:
On models without tachometer, use the Subaru select monitor or tachometer (Secondary pickup type).
7) Place the selector lever or shift lever in the “D” position (AT vehicles) or “1st” gear (MT vehicles) and drive the vehicle at 5 to 10 km/h (3 to 6 MPH).
NOTE:
● On AWD vehicles, release the parking brake.
● The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system. <Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>

8) Using the OBD-II general scan tool, check for diagnostic trouble code(s) and record the result(s).
NOTE:
● For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.
● For details concerning diagnostic trouble codes, refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST. <Ref. to 2-7 [T10A0], [T11A0].>



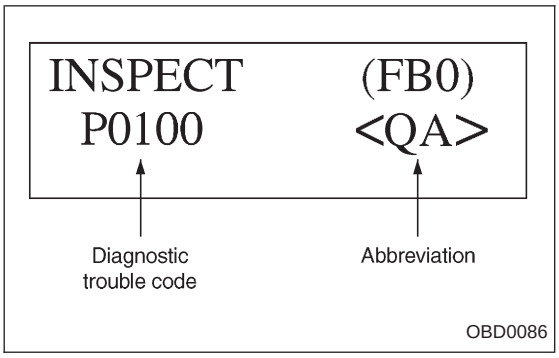
4. READ DIAGNOSTIC TROUBLE CODE (DTC) SHOWN ON DISPLAY. (MODE FB0 <INSPECTION MODE>)

Using Subaru select monitor, check for diagnostic trouble code(s) and record the result(s).
1) Select engine mode using function key.
Press the function key [0].



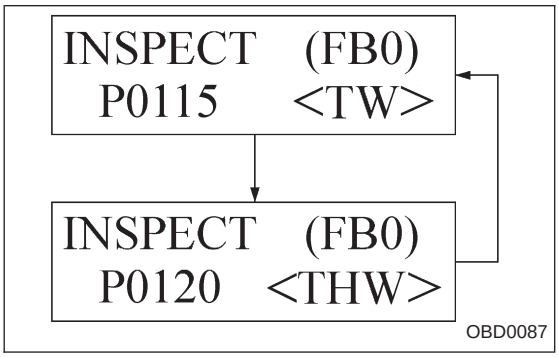
G3M0152

2) Designate mode using function key.
Press [F] [B] [0] [ENT] in that order.



OBD0086

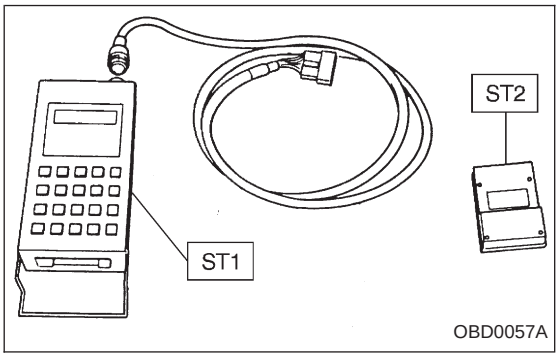
3) Ensure diagnostic trouble code(s) is shown.
(1) When there is only one diagnostic trouble code.



OBD0087

(2) When there are multiple diagnostic trouble codes.

NOTE:
For details concerning diagnostic trouble code(s), refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST. <Ref. to 2-7 [T10A0], [T11A0].>

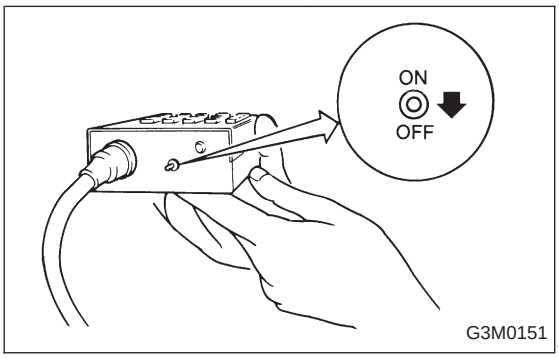


OBD0057A

F: COMPULSORY VALVE OPERATION CHECK MODE

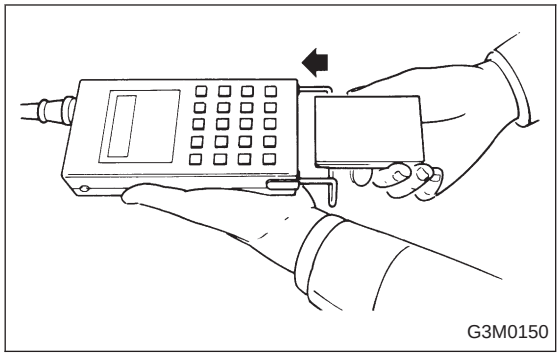
1. SUBARU SELECT MONITOR

1) Prepare Subaru select monitor and cartridge.
ST1 498307500 SELECT MONITOR KIT
ST2 498346300 CARTRIDGE

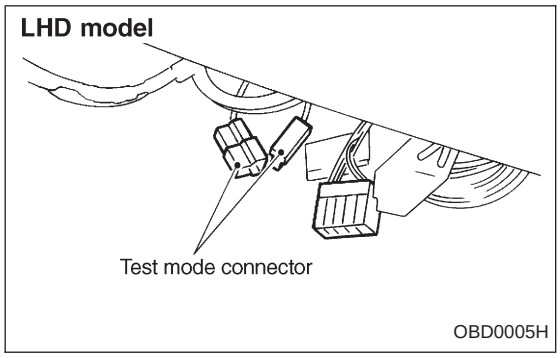


G3M0151

2) Turn ignition switch and Subaru select monitor switch to OFF.

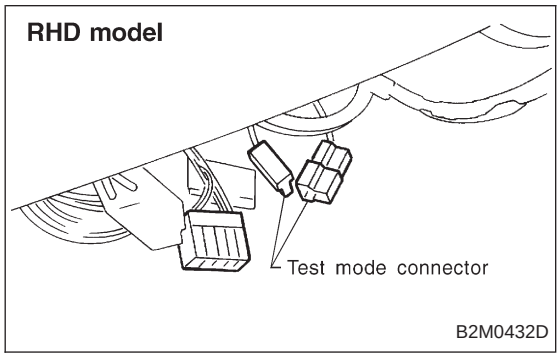

G3M0150

3) Insert cartridge into Subaru select monitor.

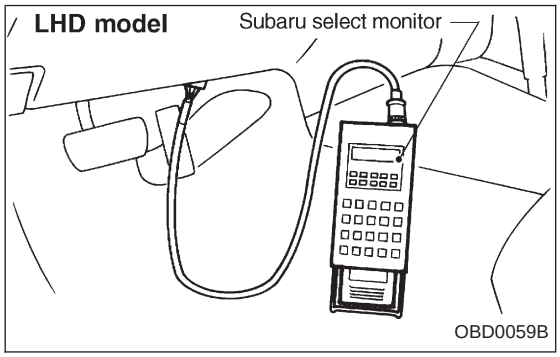


OBD0005H

4) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.

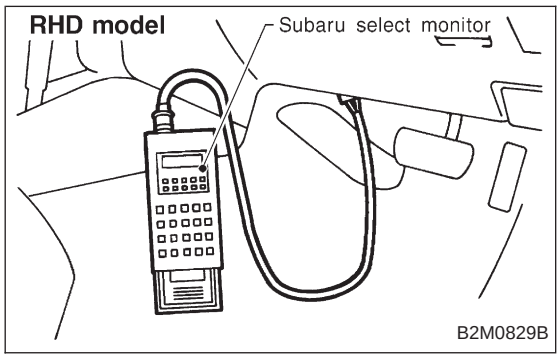


B2M0432D

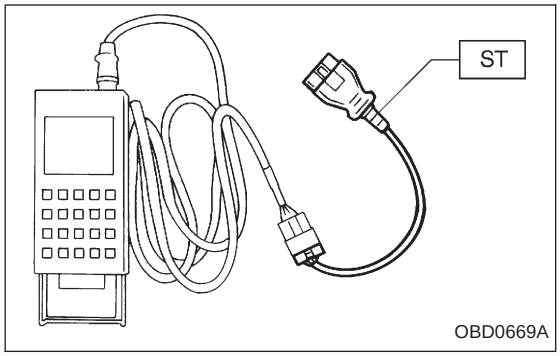


OBD0059B

5) Connect Subaru select monitor to data link connector.
● Using data link connector for Subaru select monitor only:
Connect Subaru select monitor to its data link connector located in the lower portion of the instrument panel (on the driver's side), to the side of the center console box.



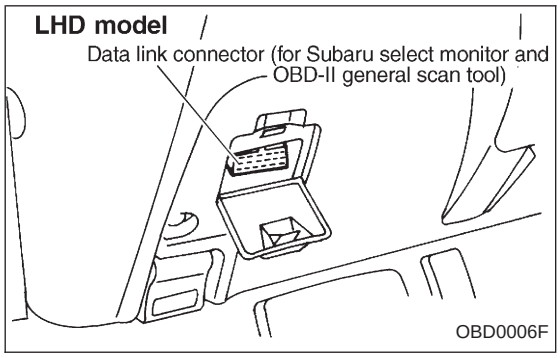
B2M0829B



● Using data link connector for Subaru select monitor and OBD-II general scan tool:

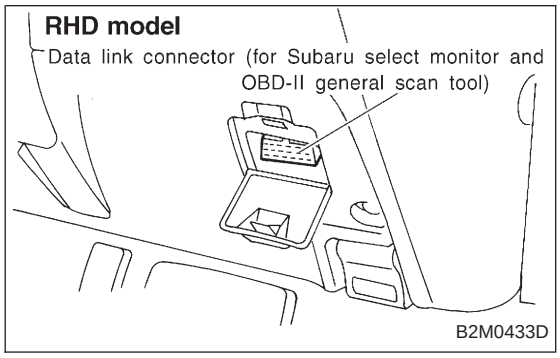
(1) Connect ST to Subaru select monitor cable.

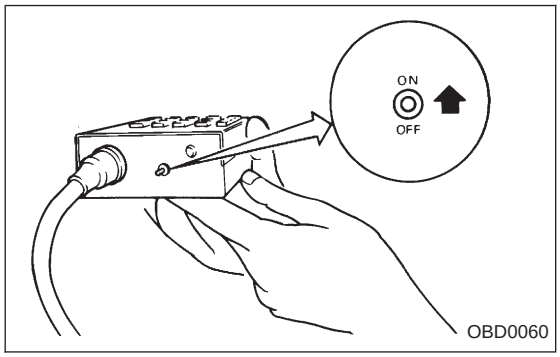
ST1 498357200 ADAPTER CABLE



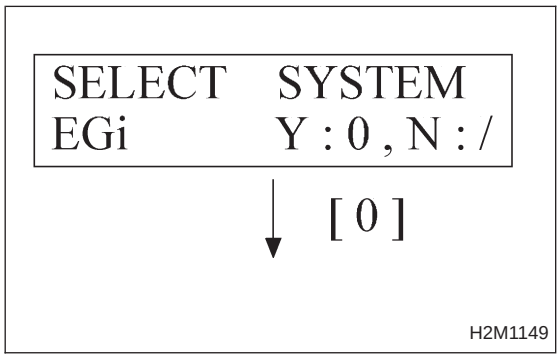
(2) Open the cover and connect Subaru select monitor to data link connector located in the lower portion of the instrument panel (on the driver's side), to the lower cover.

CAUTION:
Do not connect scan tools except for Subaru select monitor and OBD-II general scan tool.

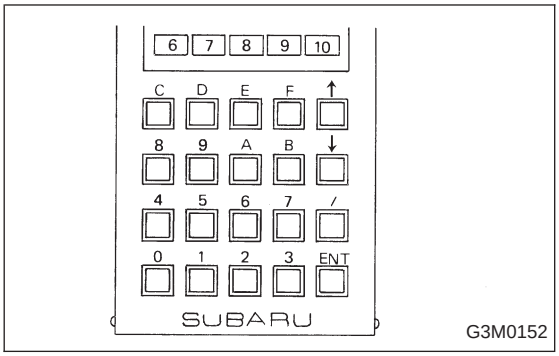




6) Turn ignition switch to ON (engine OFF) and Subaru select monitor switch to ON.

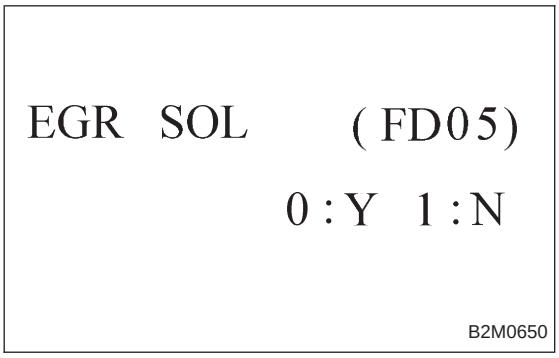


7) Select engine mode using function key.
Press the function key [0].



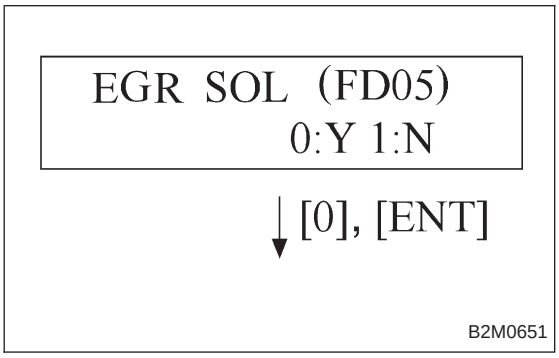
G3M0152

8) Designate mode using function key.
<Ref. to 2-7 [T3C6].>
(Example: Press [F] [D] [0] [5] [ENT] in that order.)



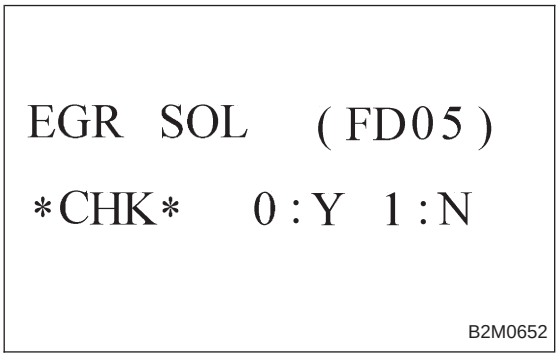
B2M0650

9) Ensure displayed message.



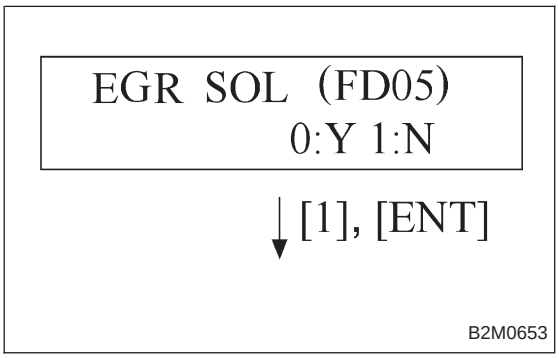
B2M0651

10) Press the function key.
(1) When executing, press the function key [0].



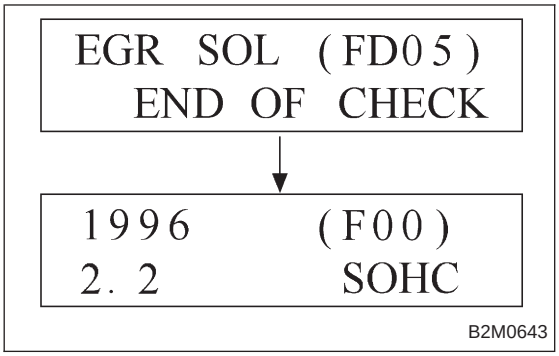
B2M0652

NOTE:
When in compulsory valve operation check mode the monitor indicates the execution of valve check on display.

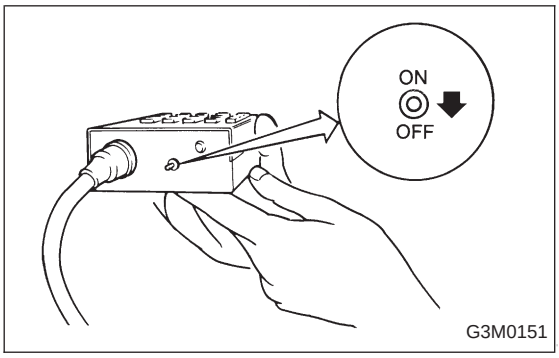


B2M0653

(2) When not executing or stopping the compulsory valve check mode, press the function key [1].



11) When compulsory valve operation check mode is exited or check completed, the monitor indicates the completion of compulsory valve operation check on the display, and automatically returns to the initial mode (FUNCTION MODE: F00).



G: FINISHING DIAGNOSIS OPERATION

1. SUBARU SELECT MONITOR

1) Turn Subaru select monitor switch and ignition switch to OFF.
2) Disconnect Subaru select monitor from its data link connector.
3) Disconnect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.

4. Cautions

A: SUPPLEMENTAL RESTRAINT SYSTEM "AIRBAG"

Airbag system wiring harness is routed near the engine control module (ECM), main relay and fuel pump relay.

CAUTION:

- **All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.**
- **Be careful not to damage Airbag system wiring harness when servicing the engine control module (ECM), transmission control module (TCM), main relay and fuel pump relay.**

B: PRECAUTIONS

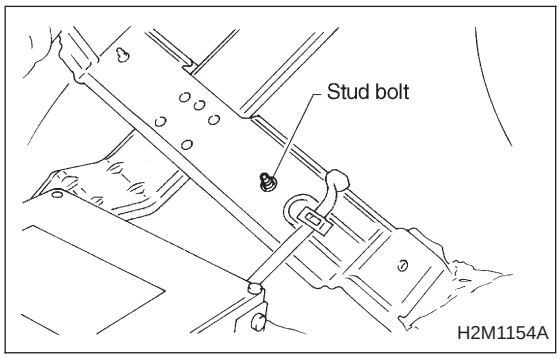
1) Never connect the battery in reverse polarity.
- The ECM will be destroyed instantly.
- The fuel injector and other part will be damaged in just a few minutes more.

2) Do not disconnect the battery terminals while the engine is running.
- A large counter electromotive force will be generated in the alternator, and this voltage may damage electronic parts such as ECM, etc.

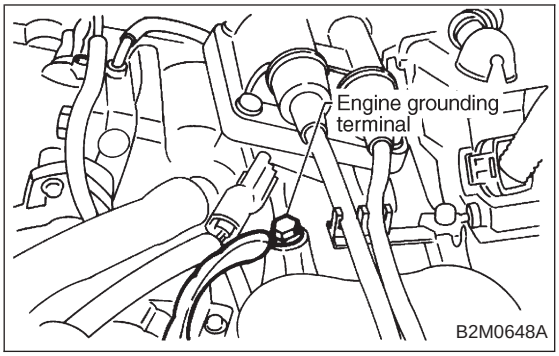
3) Before disconnecting the connectors of each sensor and the ECM, be sure to turn OFF the ignition switch.

4) Before removing ECM from the located position, disconnect two cables on battery.
- Otherwise, the ECM may be damaged.

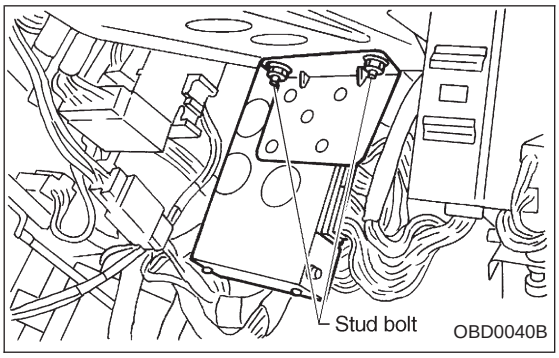
5) The connectors to each sensor in the engine compartment and the harness connectors on the engine side and body side are all designed to be waterproof. However, it is still necessary to take care not to allow water to get into the connectors when washing the vehicle, or when servicing the vehicle on a rainy day.



6) Use ECM mounting stud bolts at the body head grounding point when measuring voltage and resistance inside the passenger compartment.



7) Use engine grounding terminal or engine proper as the grounding point to the body when measuring voltage and resistance in the engine compartment.



8) Use TCM mounting stud bolts at the body head grounding point when measuring voltage and resistance inside the passenger compartment.

9) Every MFI-related part is a precision part. Do not drop them.

10) Observe the following cautions when installing a radio in MFI equipped models.

CAUTION:

- **The antenna must be kept as far apart as possible from the control unit.**
(The ECM is located under the steering column, inside of the instrument panel lower trim panel.)
- **The antenna feeder must be placed as far apart as possible from the ECM and MFI harness.**
- **Carefully adjust the antenna for correct matching.**
- **When mounting a large power type radio, pay special attention to the three items above mentioned.**
- **Incorrect installation of the radio may affect the operation of the ECM.**

11) Before disconnecting the fuel hose, disconnect the fuel pump connector and crank the engine for more than five seconds to release pressure in the fuel system. If engine starts during this operation, run it until it stops.

12) Problems in the electronic-controlled automatic transmission may be caused by failure of the engine, the electronic control system, the transmission proper, or by a combination of these. These three causes must be distinguished clearly when performing diagnostics.

13) Diagnostics should be conducted by rotating with simple, easy operations and proceeding to complicated, difficult operations. The most important thing in diagnostics is to understand the customer's complaint, and distinguish between the three causes.

14) In AT vehicles, do not continue the stall for more than five seconds at a time (from closed throttle, fully open throttle to stall engine speed).
15) On ABS or ABS/TCS vehicle, when performing driving test in jacked-up or lifted-up position, sometimes the warning light may be lit, but this is not a malfunction of the system. The reason for this is the speed difference between the front and rear wheels. After diagnosis of engine control system, perform the ABS or ABS/TCS memory clearance procedure of self-diagnosis system. <Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>

C: PRE-INSPECTION

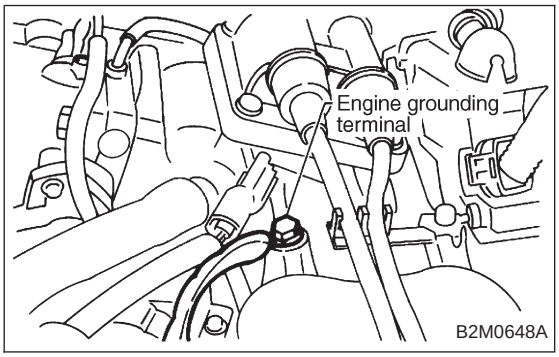
Before performing diagnostics, check the following items which might affect engine problems:

1. POWER SUPPLY

1) Measure battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V
Specific gravity: Above 1.260

2) Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

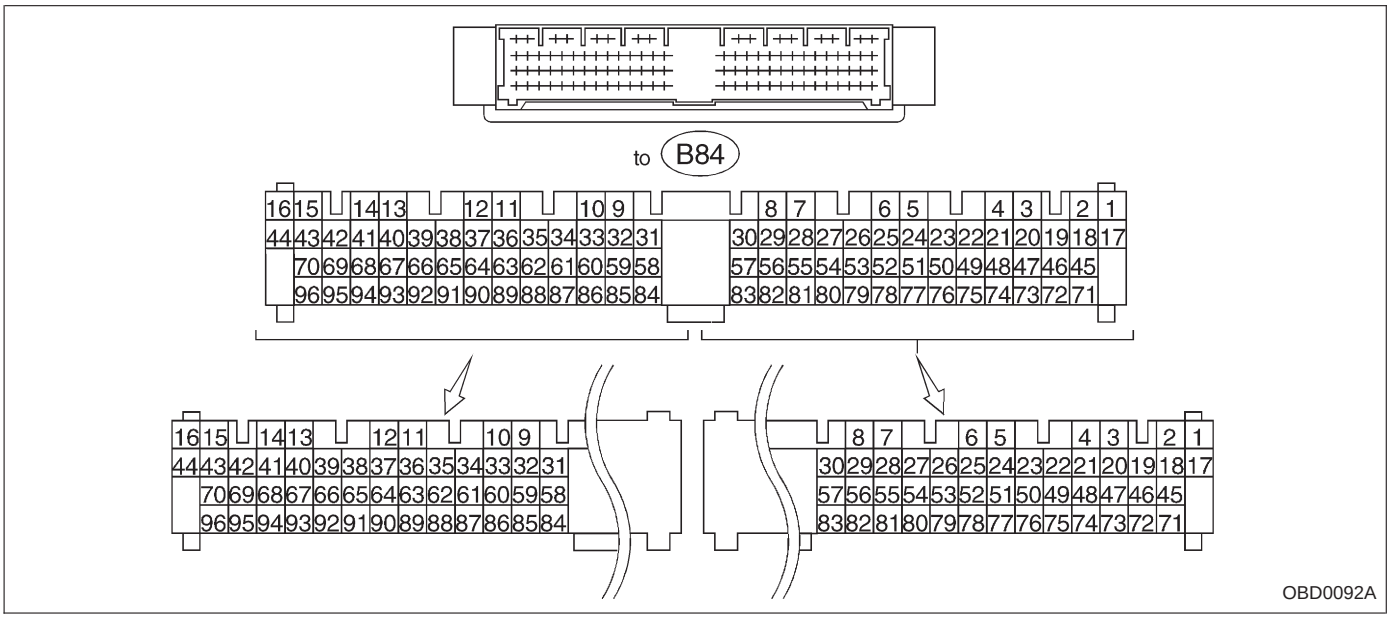


2. ENGINE GROUNDING

Make sure the engine grounding terminal is properly connected to the engine.

5. Specified Data

1. ENGINE CONTROL MODULE (ECM) I/O SIGNAL



Content		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Crankshaft position sensor	Signal (+)	B84	8	0	−7 — +7	Sensor output waveform
	Signal (−)	B84	29	0	0	—
	Shield	B84	54	0	0	—
Camshaft position sensor	Signal (+)	B84	7	0	−7 — +7	Sensor output waveform
	Signal (−)	B84	28	0	0	—
	Shield	B84	54	0	0	—
Mass air flow sensor	Signal	B84	5	0 — 0.3	0.8 — 1.2	—
	Shield	B84	57	0	0	—
	GND	B84	53	0	0	—
Throttle position sensor	Signal	B84	6	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power supply	B84	21	5	5	—
	GND	B84	20	0	0	—
Front oxygen sensor	Signal	B84	23	0	0 — 0.9	—
	Shield	B84	56	0	0	—
Rear oxygen sensor	Signal	B84	24	0	0 — 0.9	—
	Shield	B84	56	0	0	—
Engine coolant temperature sensor		B84	22	1.0 — 1.4	1.0 — 1.4	After warm-up
Vehicle speed sensor 2		B84	83	0 or 5	0 or 5	“5” and “0” are repeatedly displayed when vehicle is driven.
Starter switch		B84	86	0	0	Cranking: 8 to 14
A/C switch		B84	60	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Ignition switch		B84	85	10 — 13	13 — 14	—
Neutral position switch (MT)		B84	82	ON: 5.0±0.5 OFF: 0		● On MT model; switch is ON when gear is in neutral position.
Neutral position switch (AT)				ON: 0 OFF: 5.0±0.5		● On AT model; switch is ON when shift is in “N” or “P” position.
Test mode connector		B84	84	5	5	When connected: 0

Content		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Knock sensor	Signal	B84	3	2.8	2.8	—
	Shield	B84	56	0	0	—
AT/MT identification		B84	81	(AT) 5 (MT) 0	(AT) 5 (MT) 0	When measuring voltage between ECM and body.
Back-up power supply		B84	39	10 — 13	13 — 14	Ignition switch “OFF”: 10 — 13
Control unit power supply		B84	1	10 — 13	13 — 14	—
			2			
Ignition control	# 1, # 2	B84	41	0	1 — 3.4	—
	# 3, # 4	B84	40	0	1 — 3.4	—
Fuel injector	# 1	B84	96	10 — 13	1 — 14	Waveform
	# 2	B84	70	10 — 13	1 — 14	Waveform
	# 3	B84	44	10 — 13	1 — 14	Waveform
	# 4	B84	16	10 — 13	1 — 14	Waveform
Idle air control solenoid valve	OPEN end	B84	14	—	1 — 13	Waveform
	CLOSE end	B84	13	—	13 — 1	Waveform
Fuel pump relay control		B84	32	ON: 0.5, or less OFF: 10 — 13	0.5, or less	—
A/C relay control		B84	31	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 1 control		B84	74	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 2 control		B84	73	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	With A/C vehicles only
Self-shutoff control		B84	63	10 — 13	13 — 14	—
Malfunction indicator lamp		B84	58	—	—	Light “ON”: 1, or less Light “OFF”: 10 — 14
Engine speed output		B84	64	—	0 — 13, or more	Waveform
Torque control signal		B84	79	5	5	—
Mass air flow signal for AT		B84	47	0 — 0.3	0.8 — 1.2	—
Purge control solenoid valve		B84	72	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Atmospheric pressure sensor		B84	26	3.9 — 4.1	2.0 — 2.3	—
Pressure sources switching solenoid valve		B84	15	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
EGR solenoid valve		B84	71	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Front oxygen sensor heater signal		B84	38	0 — 1.0	0 — 1.0	—
Rear oxygen sensor heater signal		B84	37	0 — 1.0	0 — 1.0	—
Fuel temperature sensor		B84	25	2.5 — 3.8	2.5 — 3.8	● 2200 cc AWD except Taiwan spec. vehicles ● Ambient temperature: 25°C (77°F)
Fuel level sensor		B84	27	0.12 — 4.75	0.12 — 4.75	2200 cc AWD except Taiwan model
Fuel tank pressure sensor	Signal	B84	4	2.3 — 2.7	2.3 — 2.7	● 2200 cc AWD except Taiwan spec. vehicles ● The value obtained after the fuel filler cap was removed once and recapped.
	Power supply	B84	21	5	5	—
	GND	B84	20	0	0	—
Fuel tank pressure control solenoid valve		B84	10	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	2200 cc AWD except Taiwan spec. vehicles
Vent control solenoid valve		B84	35	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	2200 cc AWD except Taiwan spec. vehicles
TCS signal		B84	61	0 — 7	0 — 7	Waveform

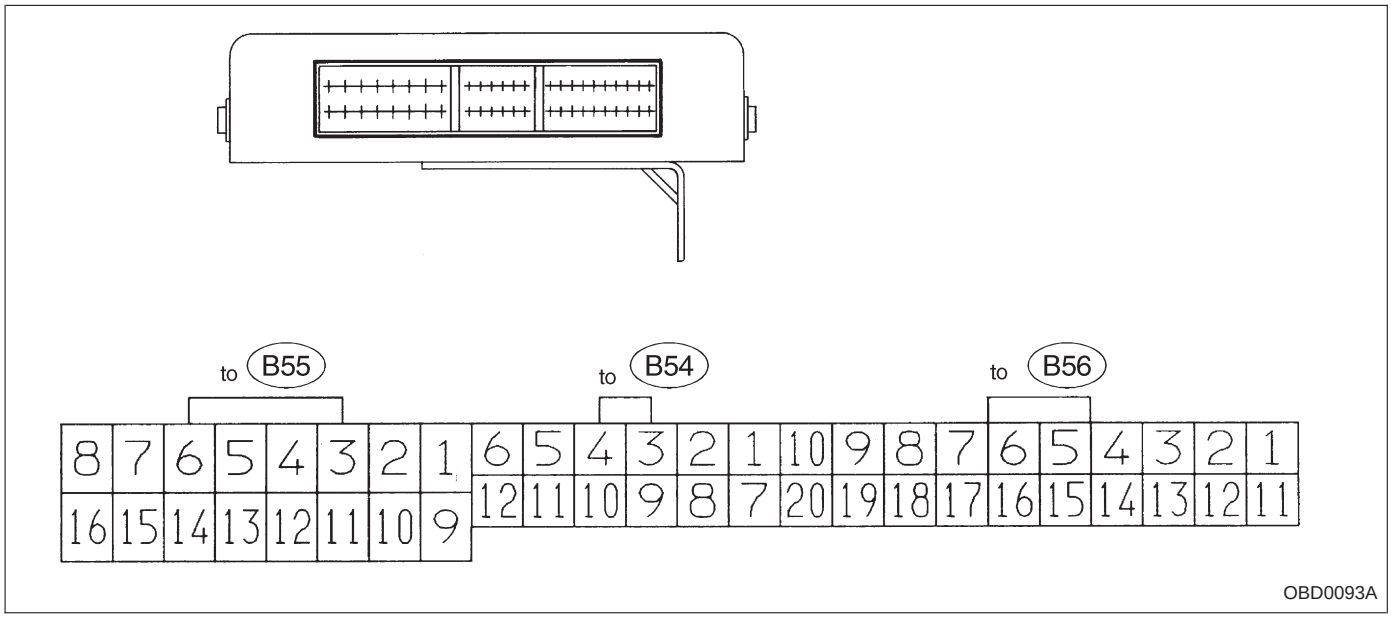
Content	Connector No.	Terminal No.	Signal (V)		Note
			Ignition SW ON (Engine OFF)	Engine ON (Idling)	
AT diagnosis input signal	B84	80	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	Waveform
GND (sensors)	B84	20	0	0	—
GND (injectors)	B84	69	0	0	—
		95			
GND (ignition system)	B84	94	0	0	—
GND (power supply)	B84	19	0	0	—
		46			
GND (control systems)	B84	17	0	0	—
		18			
GND (oxygen sensor heater)	B84	42	0	0	—

2. ENGINE CONDITION DATA

Content	Model	Specified data
Mass air flow	2200 cc	1.7 — 3.3 (g/sec): Idling
		7.1 — 14.2 (g/sec): 2,500 rpm racing
	2500 cc	2.2 — 4.2 (g/sec): Idling
		8.6 — 14.5 (g/sec): 2,500 rpm racing
Engine load	2200 cc	1.6 — 2.9 (%): Idling
		6.4 — 12.8 (%): 2,500 rpm racing
	2500 cc	1.9 — 3.5 (%): Idling
		7.2 — 12.1 (%): 2,500 rpm racing

Measuring condition:
- After warm-up the engine.
- Gear position is in “N” or “P” position.
- A/C is turned OFF.
- All accessory switches are turned OFF.

3. TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

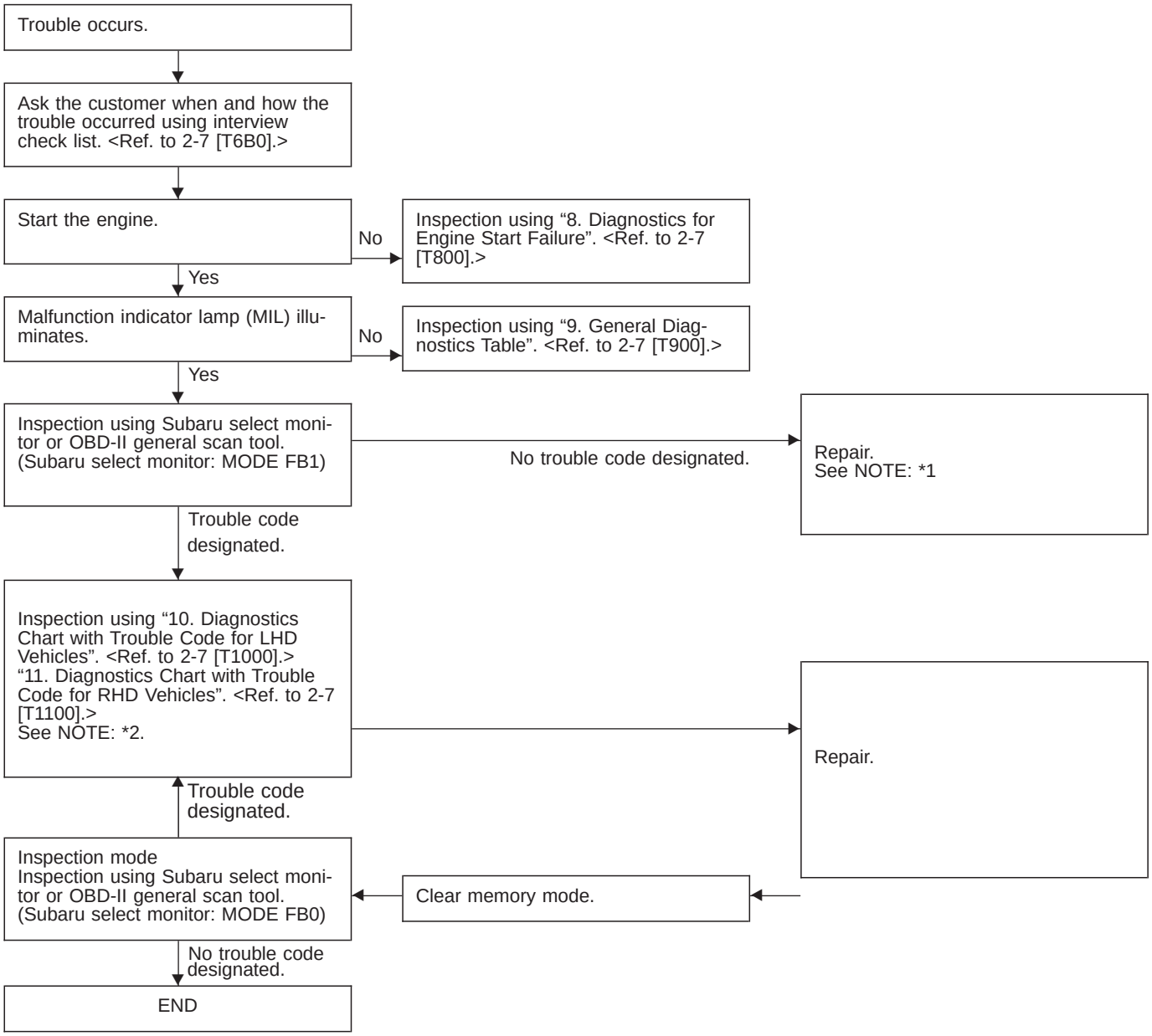


Check with ignition switch ON.

Content		Connector No.	Terminal No.	Measuring conditions	Voltage (V)
Back-up power supply		B56	14	Ignition switch OFF	10 — 16
Ignition power supply		B54	6	Ignition switch ON (with engine OFF)	10 — 16
		B55	1		
Inhibitor switch	“P” range switch	B56	9	Selector lever in “P” range	Less than 1
				Selector lever in any other than “P” range	More than 8
	“N” range switch	B56	8	Selector lever in “N” range	Less than 1
				Selector lever in any other than “N” range	More than 8
	“R” range switch	B56	10	Selector lever in “R” range	Less than 1
				Selector lever in any other than “R” range	More than 6
	“D” range switch	B54	1	Selector lever in “D” range	Less than 1
				Selector lever in any other than “D” range	More than 6
	“3” range switch	B54	2	Selector lever in “3” range	Less than 1
				Selector lever in any other than “3” range	More than 6
	“2” range switch	B54	3	Selector lever in “2” range	Less than 1
				Selector lever in any other than “2” range	More than 6
	“1” range switch	B54	4	Selector lever in “1” range	Less than 1
				Selector lever in any other than “1” range	More than 6
Brake switch		B56	7	Brake pedal depressed	More than 10.5
				Brake pedal released	Less than 1
ABS signal		B56	5	ABS switch ON	Less than 1
				ABS switch OFF	More than 6.5
AT diagnostics signal		B55	12	Ignition switch ON (with engine OFF)	Less than 1
				Ignition switch ON (with engine ON)	More than 10
Diagnosis switch		B56	6	Diagnosis connector connected.	Less than 1
				Diagnosis connector disconnected.	More than 6

Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Throttle position sensor	B54	8	Throttle fully closed.	0.3 — 0.7	—
			Throttle fully open.	4.3 — 4.9	
Throttle position sensor power supply	B56	19	Ignition switch ON (with engine OFF)	4.8 — 5.3	—
ATF temperature sensor	B54	10	ATF temperature 20°C (68°F)	2.9 — 4.0	2.1 k — 2.9 k
			ATF temperature 80°C (176°F)	1.0 — 1.4	275 — 375
Vehicle speed sensor 1	B54	12	Vehicle stopped.	0	450 — 720
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)	
Vehicle speed sensor 2	B56	11	When vehicle is slowly moved at least 2 meters (7ft).	Less than 1↔More than 9	—
Engine speed signal	B54	5	Ignition switch ON (with engine OFF).	More than 10.5	—
			Ignition switch ON (with engine ON).	8 — 11	
Cruise set signal	B56	3	When cruise control is set (SET lamp ON).	Less than 1	—
			When cruise control is not set (SET lamp OFF).	More than 6.5	
Torque control signal	B55	16	Ignition switch ON	4 — 6	—
Mass air flow signal	B54	9	Engine idling after warm-up	0.5 — 1.2	—
Shift solenoid 1	B55	14	1st or 4th gear	More than 9	20 — 32
			2nd or 3rd gear	Less than 1	
Shift solenoid 2	B55	13	1st or 2nd gear	More than 9	20 — 32
			3rd or 4th gear	Less than 1	
Shift solenoid 3	B55	15	Selector lever in “N” range (with throttle fully closed).	Less than 1	20 — 32
			Selector lever in “D” range (with throttle fully closed).	More than 9	
Duty solenoid A	B55	8	Throttle fully closed (with engine OFF) after warm-up.	2.0 — 4.0	2.0 — 4.5
			Throttle fully open (with engine OFF) after warm-up.	Less than 1	
Dropping resistor	B55	7	Throttle fully closed (with engine OFF) after warm-up.	More than 8.5	12 — 18
			Throttle fully open (with engine OFF) after warm-up.	Less than 1	
Duty solenoid B	B55	5	When lock up occurs.	More than 8.5	9 — 17
			When lock up is released.	Less than 0.5	
Duty solenoid C (AWD model only)	B55	3	Fuse on FWD switch	More than 8.5	9 — 17
			Fuse removed from FWD switch (with throttle fully open and with select lever in 1st gear).	Less than 0.5	
Sensor ground line 1	B54	7	—	0	Less than 1
Sensor ground line 2	B56	20	—	0	Less than 1
System ground line	B56	1	—	0	Less than 1
Power system ground line	B55	10	—	0	Less than 1
FWD switch (AWD model only)	B56	2	Fuse removed.	6 — 9.1	—
			Fuse installed.	Less than 1	
Data link signal (Subaru select monitor)	B56	12	—	—	—
		13	—	—	
AT diagnosis signal	B56	11	Ignition switch ON	Less than 1 ↔ More than 4	—

6. Basic Diagnostic Procedure



NOTE:
●*1: If trouble code is not shown on display although the MIL illuminates, perform diagnostics of the MIL (CHECK ENGINE LIGHT) circuit or combination meter. <Ref. to 2-7 [T700].>
●*2: Carry out the basic check, only when trouble code about automatic transmission is shown on display. <Ref. to 2-7 [T6A0].>

A: BASIC CHECK ITEMS FOR AT

When trouble code about automatic transmission is shown on display, carry out the following basic check. After that, carry out the replacement or repair work.

1) ATF level check
2) Differential gear oil level check
3) ATF leak check
4) Differential gear oil leak check
5) Brake band adjustment
6) Stall test
7) Line pressure test
8) Transfer clutch pressure test
9) Time lag test
10) Road test
11) Shift characteristics

NOTE:
As for the method, refer to 3-2 [W2A0], [W2B1], [W300].

B: CHECK LIST FOR INTERVIEW

1. CHECK LIST NO. 1

Check the following items when problem has occurred.

NOTE:
Use copies of this page for interviewing customers.

Customer's name		Engine no.	
Date of sale		Fuel brand	
Date of repair		Odometer reading	km
Vin no.			miles
Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Others:		
Outdoor temperature	F(°C)		
	☐ Hot ☐ Warm ☐ Cool ☐ Cold		
Place	☐ Highway ☐ Suburbs ☐ Inner city ☐ Uphill ☐ Downhill ☐ Rough road ☐ Others:		
Engine temperature	☐ Cold ☐ Warming-up ☐ After warming-up ☐ Any temperature ☐ Others:		
Engine speed	rpm		
Vehicle speed	MPH		
Driving conditions	☐ Not affected ☐ At starting ☐ While idling ☐ At racing ☐ While accelerating ☐ While cruising ☐ While decelerating ☐ While turning (RH/LH)		
Headlight	☐ ON/☐ OFF	Rear defogger	☐ ON/☐ OFF
Blower	☐ ON/☐ OFF	Radio	☐ ON/☐ OFF
A/C compressor	☐ ON/☐ OFF	CD/Cassette	☐ ON/☐ OFF
Cooling fan	☐ ON/☐ OFF	Car phone	☐ ON/☐ OFF
Front wiper	☐ ON/☐ OFF	CB	☐ ON/☐ OFF
Rear wiper	☐ ON/☐ OFF		

2. CHECK LIST NO. 2

Check the following items about the vehicle's state when MIL turns on.

NOTE:
Use copies of this page for interviewing customers.

a) Other warning lights or indicators turn on. ☐ Yes/☐ No
☐ Low fuel warning light ☐ Charge indicator light ☐ AT diagnostics indicator light ☐ ABS warning light ☐ TCS warning light ☐ Engine oil pressure warning light
b) Fuel level
● Lack of gasoline: ☐ Yes/☐ No ● Indicator position of fuel gauge:
c) Intentional connecting or disconnecting of harness connectors or spark plug cords: ☐ Yes/☐ No
● What:
d) Intentional connecting or disconnecting of hoses: ☐ Yes/☐ No
● What:
e) Installing of parts other than genuine parts: ☐ Yes/☐ No
● What: ● Where:
f) Occurrence of noise: ☐ Yes/☐ No
● From where: ● What kind:
g) Occurrence of smell: ☐ Yes/☐ No
● From where: ● What kind:
h) Intrusion of water into engine compartment or passenger compartment: ☐ Yes/☐ No
i) Troubles occurred
☐ Engine does not start. ☐ Engine stalls during idling. ☐ Engine stalls while driving. ☐ Engine speed decreases. ☐ Engine speed does not decrease. ☐ Rough idling ☐ Poor acceleration ☐ Back fire ☐ After fire ☐ No shift ☐ Excessive shift shock

7. Diagnostics for CHECK ENGINE Malfunction Indicator Lamp (MIL)

A: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT COME ON.

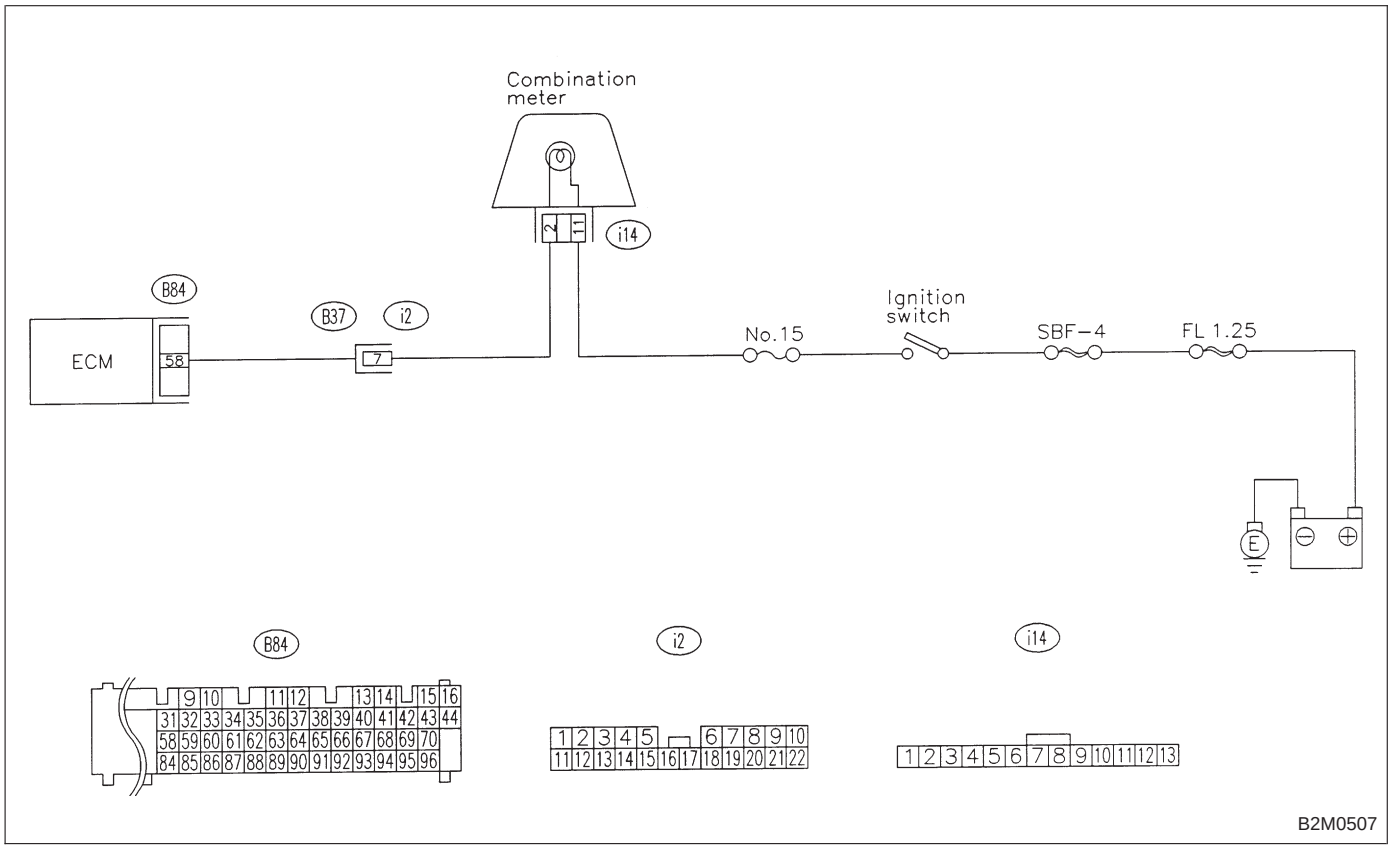
DIAGNOSIS:

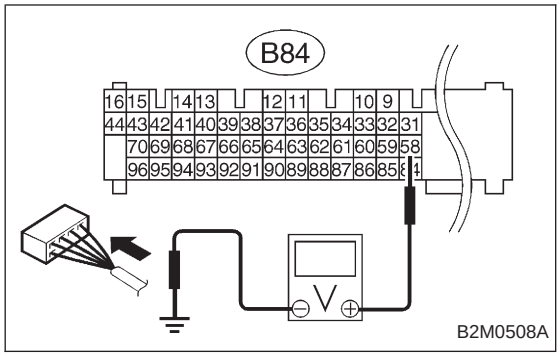
● The CHECK ENGINE malfunction indicator lamp (MIL) circuit is open or shorted.

TROUBLE SYMPTOM:

● When ignition switch is turned ON (engine OFF), MIL does not come on.

WIRING DIAGRAM:





7A1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM connector and chassis ground.

CHECK : ***Connector & terminal (B84) No. 58 (+) — Chassis ground (−): Is the voltage less than 1 V?***

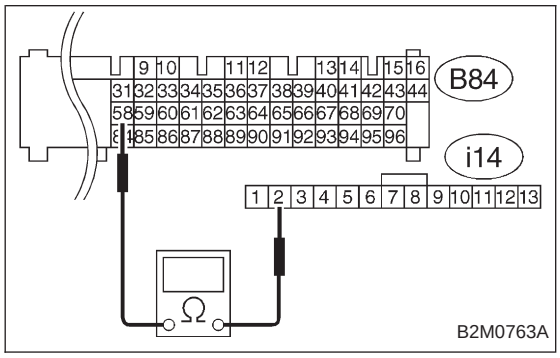
YES : Go to step **7A2**.
NO : Go to next CHECK .

CHECK : ***Does the MIL come on when shaking or pulling ECM connector and harness?***

YES : Repair poor contact in ECM connector.
NO : Go to next CHECK .

CHECK : ***Is ECM connector correctly connected?***

YES : Replace ECM.
NO : Repair connection of ECM connector.



7A2	CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Remove combination meter. <Ref. to 6-2 [W13A1].>
3) Disconnect connector from ECM and combination meter.
4) Measure resistance of harness between ECM and combination meter connector.

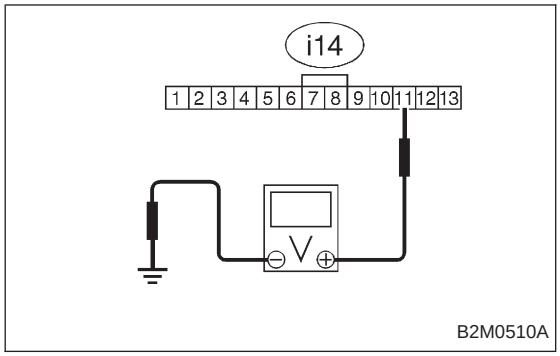
CHECK : ***Connector & terminal (B84) No. 58 — (i14) No. 2: Is resistance less than 1 Ω?***

YES : Go to next CHECK .
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and combination meter connector
- Poor contact in coupling connector (B37)

CHECK : ***Is there poor contact in combination meter connector?***

YES : Repair poor contact in combination meter connector.
NO : Go to step **7A3**.



7A3	**CHECK HARNESS BETWEEN COMBINATION METER AND IGNITION SWITCH CONNECTOR.**

1) Turn ignition switch to ON.
2) Measure voltage between combination meter connector and chassis ground.

CHECK ***: Connector & terminal (i14) No. 11 (+) — Chassis ground (−): Is voltage more than 10 V?***

YES : Go to next CHECK .

NO : Check the following and repair if necessary.

- Blown out fuse (No. 15).

NOTE:
If replaced fuse (No. 15) blows easily, check the harness for short circuit of harness between fuse (No. 15) and combination meter connector.

- Open or short circuit in harness between fuse (No. 15) and combination meter connector
- Open or short circuit in harness between fuse (No. 15) and ignition switch connector
- Poor contact in ignition switch connector

CHECK ***: Is there poor contact in combination meter connector?***

YES : Repair poor contact in combination meter connector.

NO : Replace bulb or combination meter.

B: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT GO OFF.

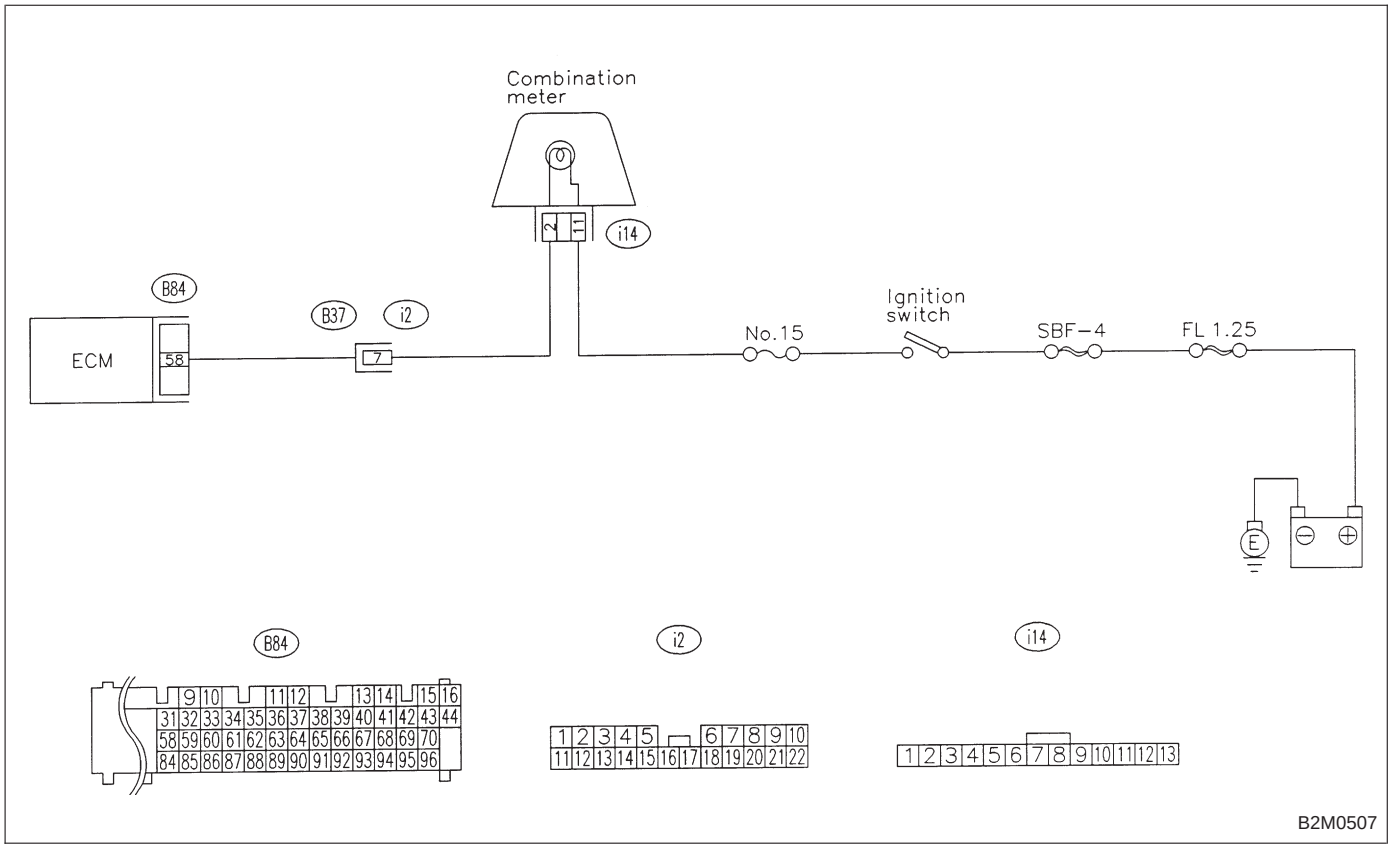
DIAGNOSIS:

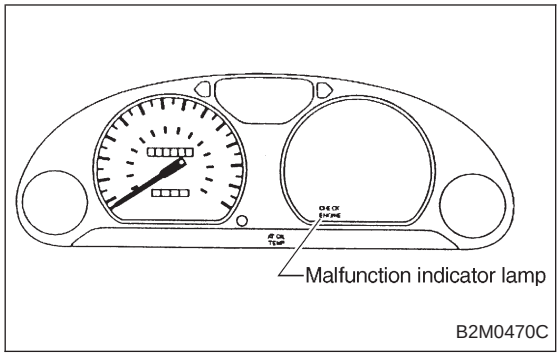
● The CHECK ENGINE malfunction indicator lamp (MIL) circuit is shorted.

TROUBLE SYMPTOM:

● Although MIL comes on when engine runs, trouble code is not shown on Subaru select monitor or OBD-II general scan tool display.

WIRING DIAGRAM:





7B1	CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from ECM.
3) Turn ignition switch to ON.

CHECK ***: Does the MIL come on?***

YES : Repair ground short circuit in harness between combination meter and ECM connector.

NO : Replace ECM.

C: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT BLINK AT A CYCLE OF 3 HZ.

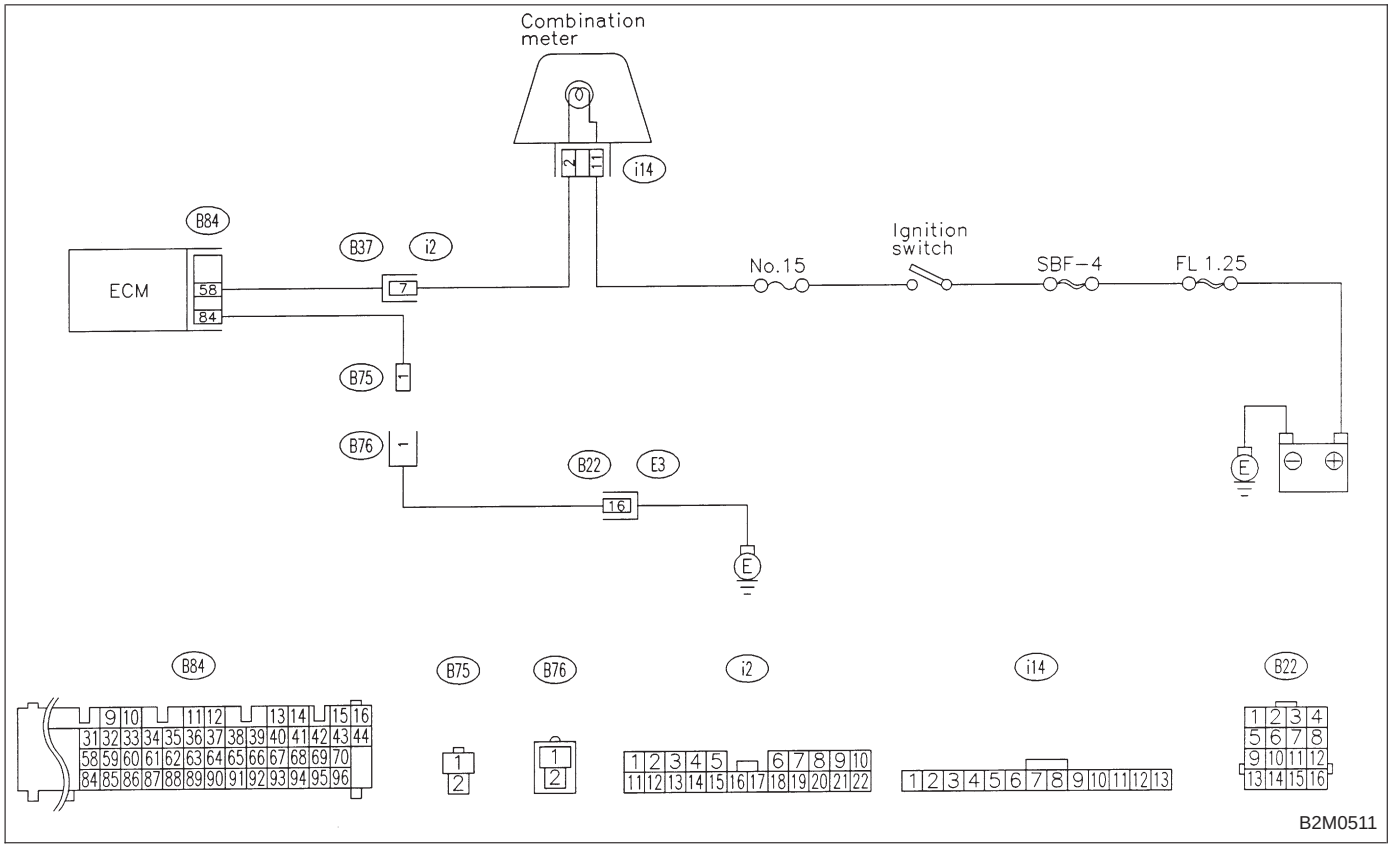
DIAGNOSIS:

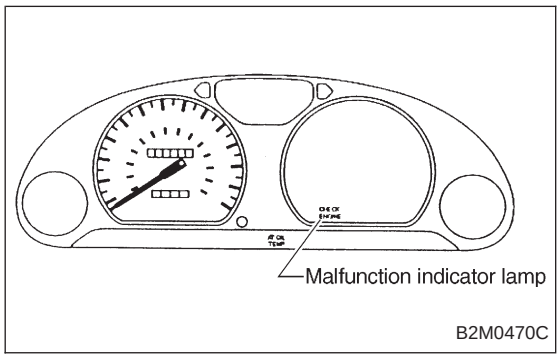
- The CHECK ENGINE malfunction indicator lamp (MIL) circuit is open or shorted.
- Test mode connector circuit is in open.

TROUBLE SYMPTOM:

- When inspection mode, MIL does not blink at a cycle of 3 Hz.

WIRING DIAGRAM:





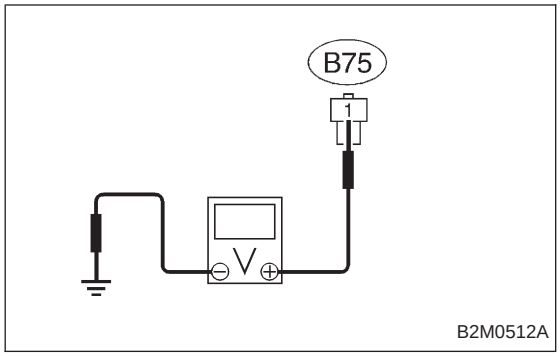
7C1	CHECK OPERATION OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL).

1) Turn ignition switch to OFF.
2) Disconnect test mode connector.
3) Turn ignition switch to ON.

CHECK ***: Does the MIL come on?***

YES : Go to step **7C2**.

NO : Repair the MIL circuit. <Ref. to 2-7 [T7A0].>



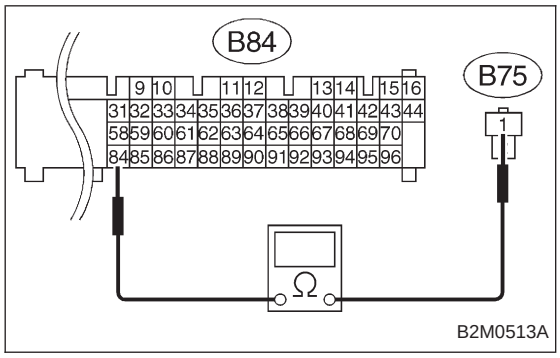
7C2	CHECK OUTPUT SIGNAL FROM ECM.

Measure voltage between test mode connector and chassis ground.

CHECK : ***Connector & terminal (B75) No.1 (+) — Chassis ground (−): Is voltage less than 1 V?***

YES : Go to step **7C3**.

NO : Go to step **7C4**.



7C3	CHECK HARNESS BETWEEN ECM AND TEST MODE CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from ECM.
3) Measure resistance of harness between ECM and test mode connector.

CHECK : ***Connector & terminal (B84) No.84 — (B75) No.1: Is resistance less than 1 Ω?***

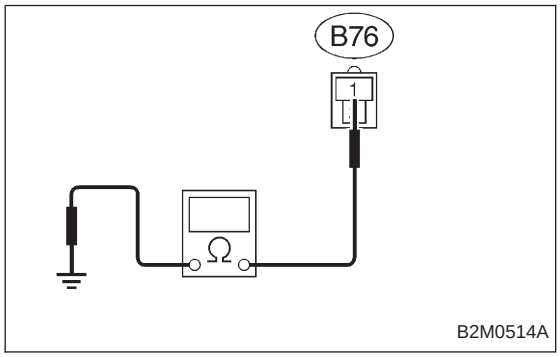
YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM and test mode connector.

CHECK : ***Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



7C4	CHECK GROUND CIRCUIT.

1) Turn ignition switch to OFF.
2) Measure resistance of harness between test mode connector and chassis ground.

CHECK : ***Connector & terminal (B76) No.1 — Chassis ground: Is resistance less than 5 Ω?***

YES : Repair poor contact in test mode connector.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between test mode and coupling connector (B22)
- Open circuit in harness between coupling connector (B22) and engine grounding terminal
- Poor contact in coupling connector (B22)

D: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) REMAINS BLINKING AT A CYCLE OF 3 Hz.

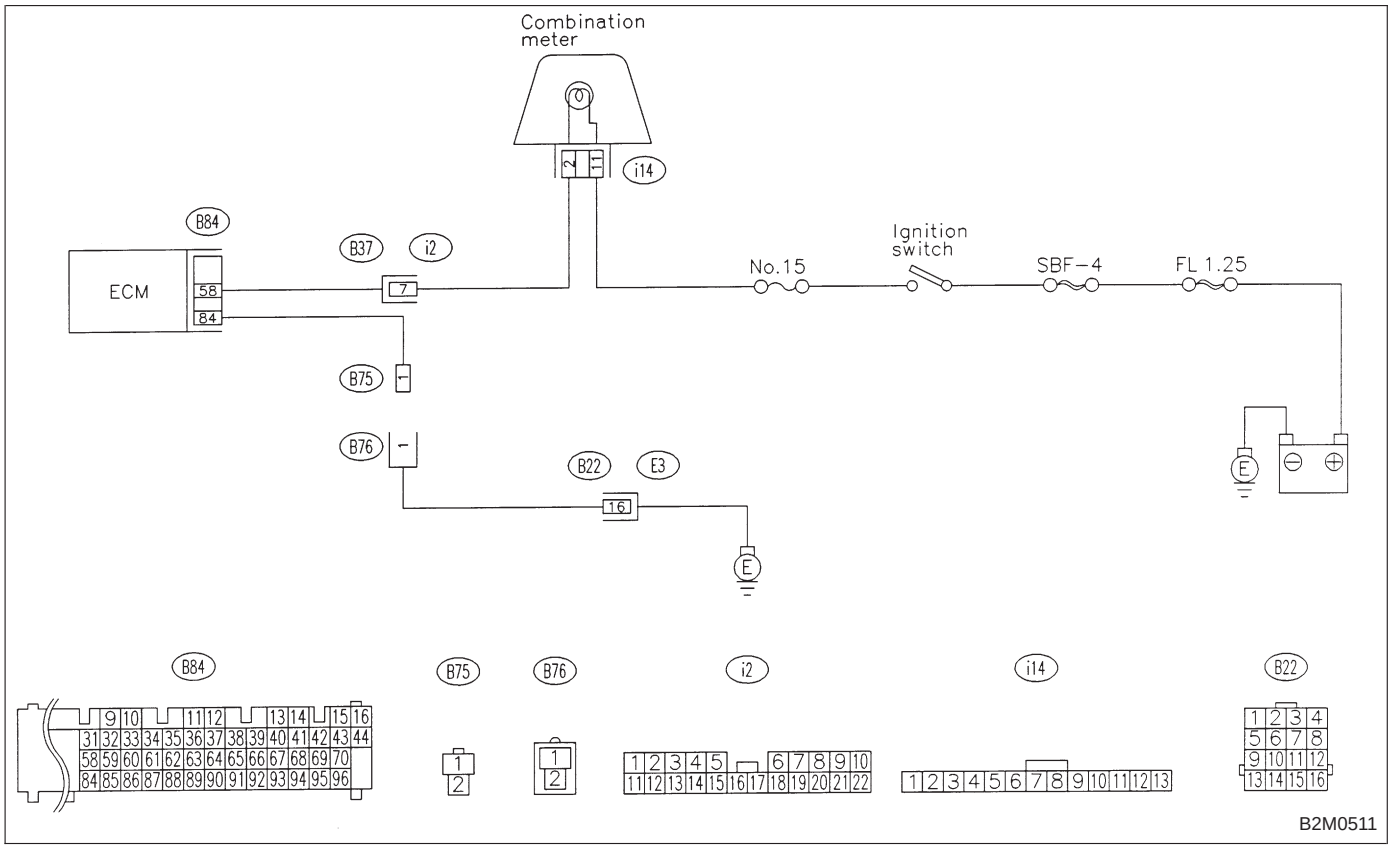
DIAGNOSIS:

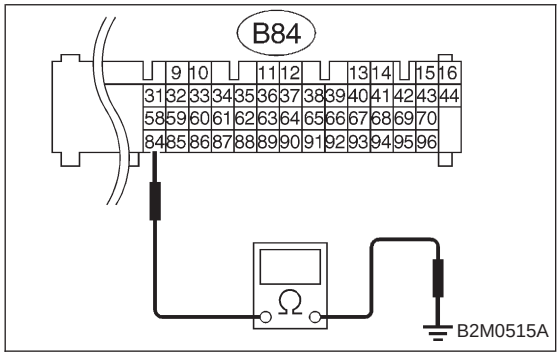
- Test mode connector circuit is shorted.

TROUBLE SYMPTOM:

- Even though test mode connector is disconnected, MIL blinks at a cycle of 3 Hz when ignition switch is turned to ON.

WIRING DIAGRAM:





7D1	CHECK HARNESS BETWEEN ECM CONNECTOR AND ENGINE GROUNDING TERMINAL.

1) Turn ignition switch to OFF.
2) Disconnect connector from ECM.
3) Measure resistance of harness between ECM connector and chassis ground.

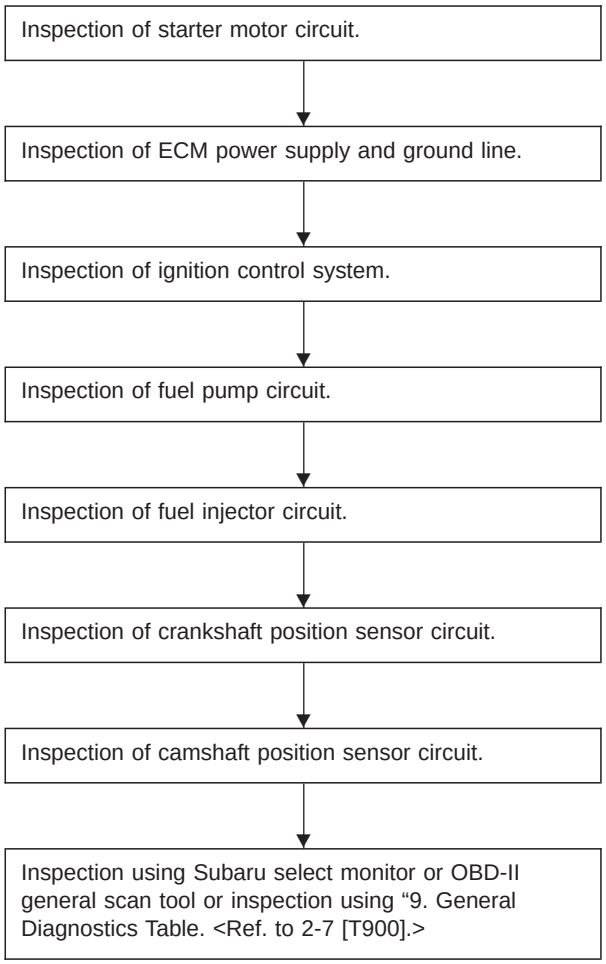
CHECK ***: Connector & terminal (B84) No.84 — Chassis ground: Is resistance less than 5 Ω?***

YES : Repair short circuit in harness between ECM and test mode connector.

NO : Replace ECM.

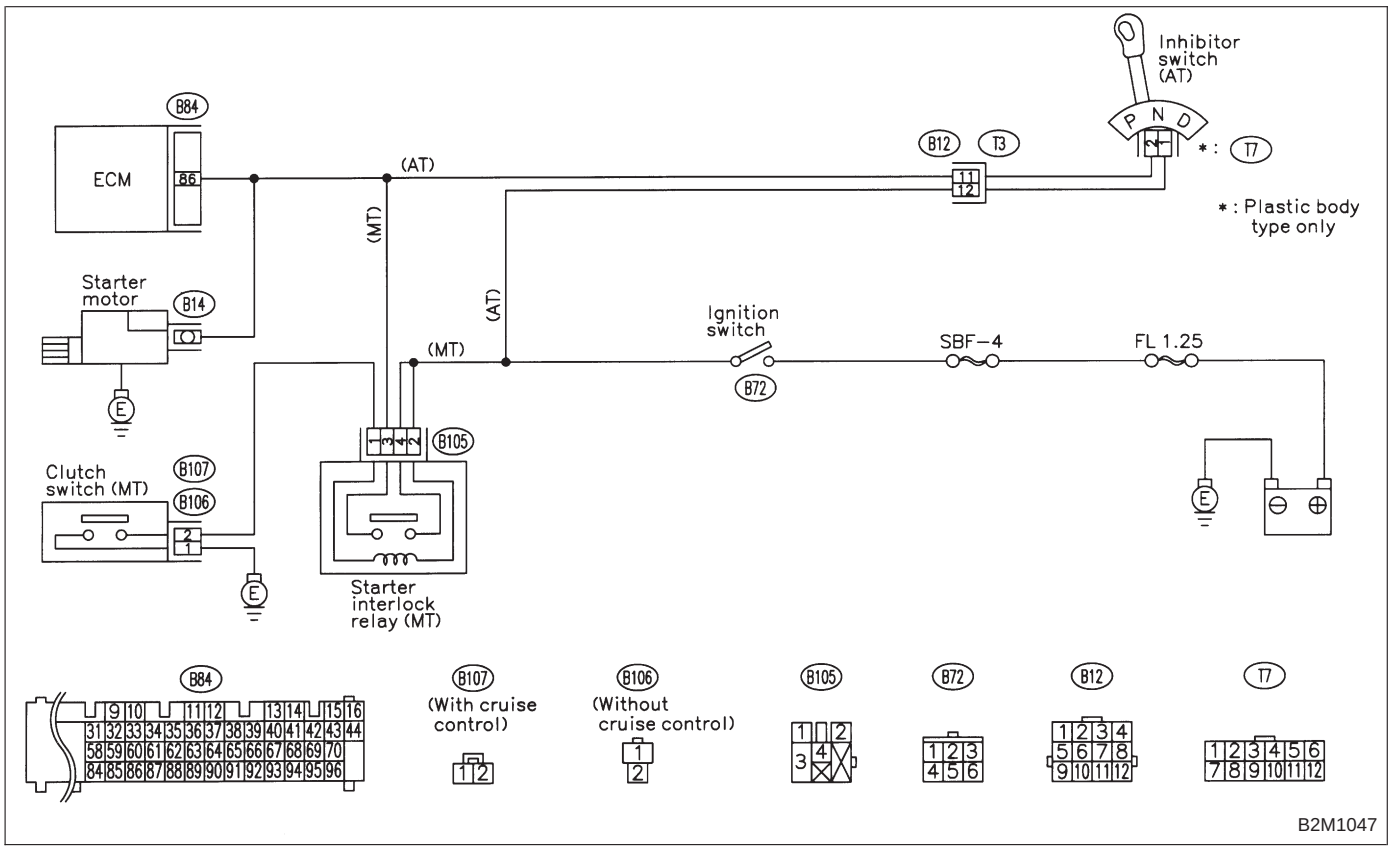
8. Diagnostics for Engine Starting Failure

A: BASIC DIAGNOSTICS CHART

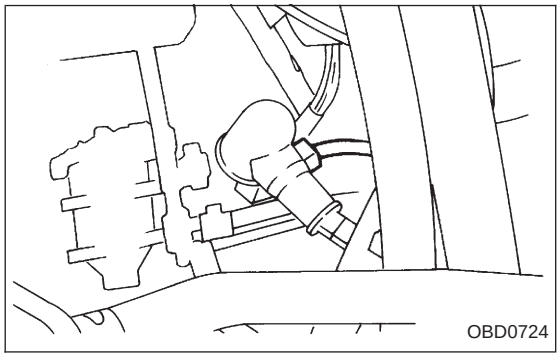


B: STARTER MOTOR CIRCUIT

WIRING DIAGRAM:

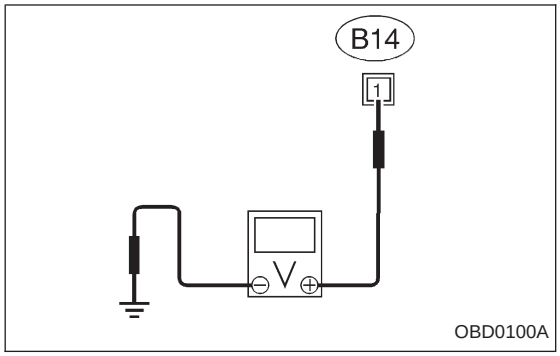


CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



8B1	**CHECK INPUT SIGNAL FOR STARTER MOTOR.**

1) Turn ignition switch to OFF.
2) Disconnect connector from starter motor.
3) Turn ignition switch to ST.

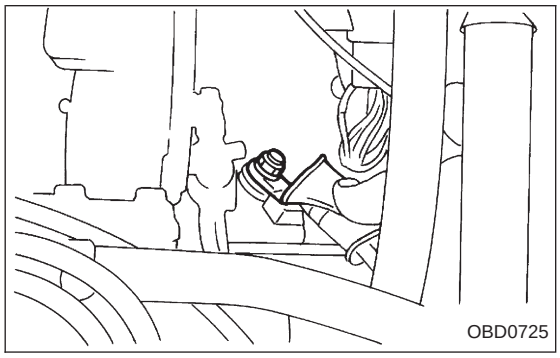


4) Measure power supply voltage between starter motor connector terminal and engine ground.

CHECK ***: Connector & terminal (B14) No. 1 (+) — Engine ground (−): Is the voltage more than 10 V?***

NOTE:
- On AT vehicles, place the selector lever in the “P” or “N” position.
- On MT vehicles, depress the clutch pedal.

YES : Go to step **8B2**.
NO : Go to step **8B3**.



8B2	CHECK GROUND CIRCUIT OF STARTER MOTOR.

1) Turn ignition switch to OFF.
2) Disconnect terminal from starter motor.
3) Measure resistance of ground cable between ground cable terminal and engine ground.

CHECK ***: Is resistance less than 5 Ω?***

YES : Check starter motor. <Ref. to 6-1 [K100].>
NO : Repair open circuit of ground cable.

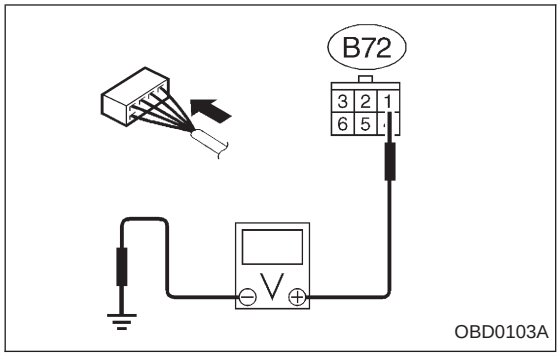
8B3	CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.

1) Turn ignition switch to OFF.
2) Remove SBF No. 4 from main fuse box.
3) Measure resistance of fuse.

CHECK ***: Is resistance less than 1 Ω?***

NO : Replace SBF No. 4.
YES : Go to next step 4).

4) Install SBF No. 4 to main fuse box.
5) Turn ignition switch to ON.



6) Measure power supply voltage between ignition switch connector and chassis ground.

CHECK : ***Connector & terminal (B72) No. 1 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Go to step **8B4**.

NO : Repair open circuit in harness between ignition switch and SBF No. 4 connector.

8B4	CHECK TRANSMISSION TYPE.

CHECK : ***Is transmission type AT?***

YES : Go to step **8B5**.

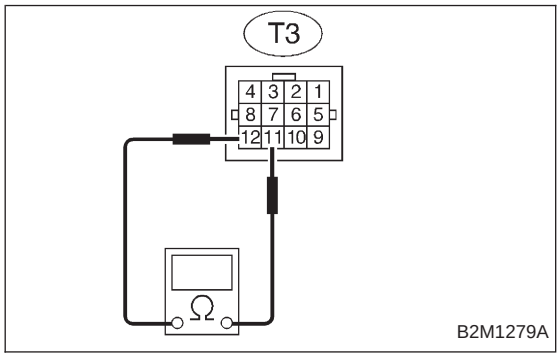
NO : Go to step **8B9**.

8B5	CHECK INHIBITOR SWITCH TYPE.

CHECK : ***Is inhibitor switch type plastic body?***

YES : Go to step **8B6**.

NO : Go to step **8B8**.



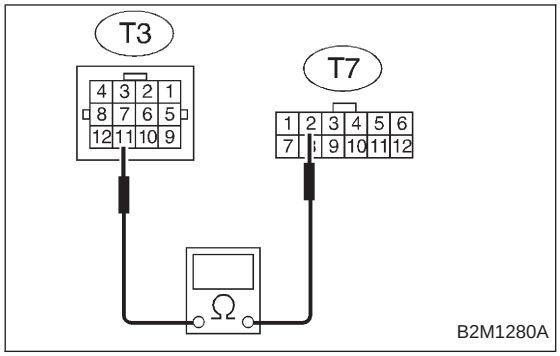
8B6	CHECK INHIBITOR SWITCH.

1) Turn ignition switch to OFF.
2) Place the selector lever in the “P” or “N” position.
3) Measure resistance between transmission harness connector receptacle’s terminals.

CHECK : ***Connector & terminal (T3) No. 11 — No. 12: Is the resistance less than 1 Ω?***

YES : Repair open circuit in harness between starter motor and ignition switch connector.

NO : Go to step **8B7**.



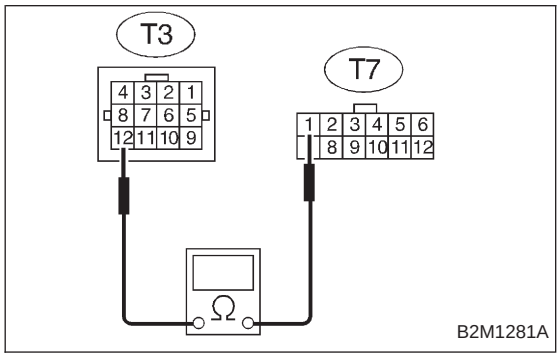
8B7	CHECK TRANSMISSION HARNESS.

1) Disconnect connector from inhibitor switch.
2) Measure resistance of harness between transmission harness and inhibitor switch connector.

CHECK ***: Connector & terminal (T3) No. 11 — (T7) No. 2: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between transmission harness and inhibitor switch connector.



CHECK ***: Connector & terminal (T3) No. 12 — (T7) No. 1: Is the resistance less than 1 Ω?***

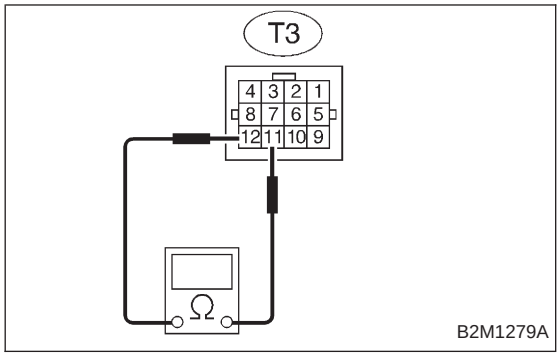
YES : Go to next CHECK .

NO : Repair open circuit in harness between transmission harness and inhibitor switch connector.

CHECK ***: Is there poor contact in inhibitor switch connector?***

YES : Repair poor contact in inhibitor switch connector.

NO : Replace inhibitor switch.



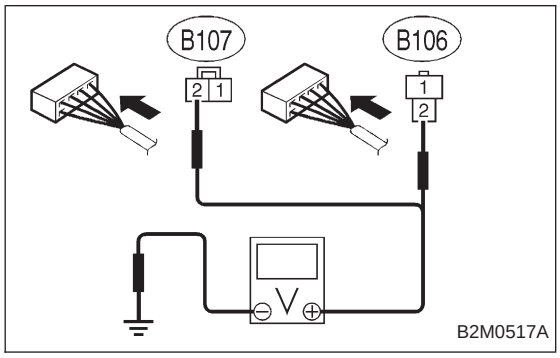
8B8	CHECK INHIBITOR SWITCH.

1) Turn ignition switch to OFF.
2) Place the selector lever in the “P” or “N” position.
3) Disconnect connector from transmission harness connector.
4) Measure resistance between transmission harness connector receptacle’s terminals.

CHECK ***: Connector & terminal***
(T3) No. 11 — No. 12:
Is the resistance less than 1 Ω?

YES : Repair open circuit in harness between starter motor and ignition switch connector.

NO : Replace inhibitor switch.



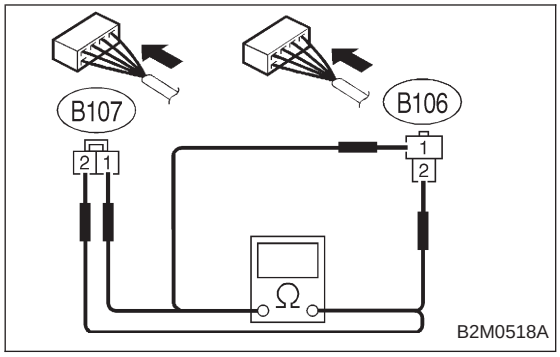
8B9	CHECK STARTER INTERLOCK CIRCUIT.

1) Turn ignition switch to “ST”.
2) Measure voltage between clutch switch connector and chassis ground.

CHECK ***: Connector & terminal***
● With cruise control
(B107) No. 2 (+) — Chassis ground (−):
● Without cruise control
(B106) No. 2 (+) — Chassis ground (−):
Is the voltage more than 10 V?

NO : Replace starter interlock relay.

YES : Go to next step 3).



3) Turn ignition switch to OFF.
4) Measure resistance between clutch switch connector terminals while depressing the clutch pedal.

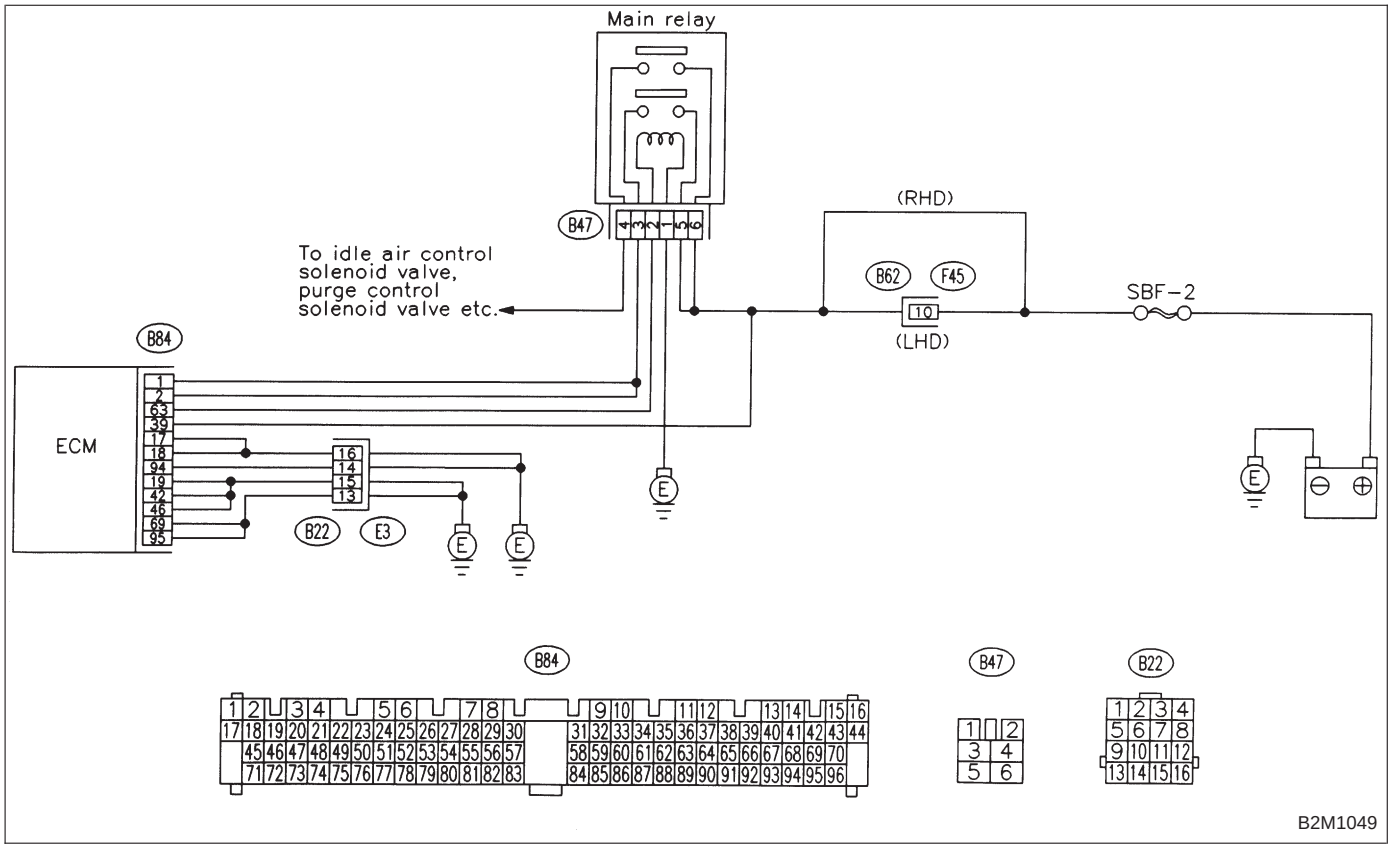
CHECK ***: Connector & terminal***
● With cruise control
(B107) No. 1 — No. 2:
● Without cruise control
(B106) No. 1 — No. 2:
Is the resistance less than 10 Ω?

YES : Repair open circuit in harness between starter motor and ignition switch connector.

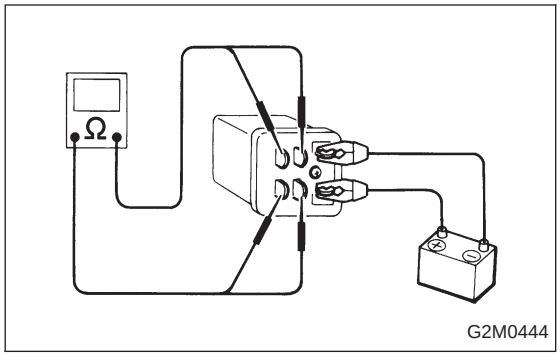
NO : Replace clutch switch.

C: CONTROL MODULE POWER SUPPLY AND GROUND LINE

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



8C1	CHECK MAIN RELAY.

1) Turn the ignition switch to OFF.
2) Remove main relay.
3) Connect battery to main relay terminals No. 1 and No. 2.
4) Measure resistance between main relay terminals.

CHECK : ***Terminals***
No. 3 — No. 5:
Is the resistance less than 10 Ω?

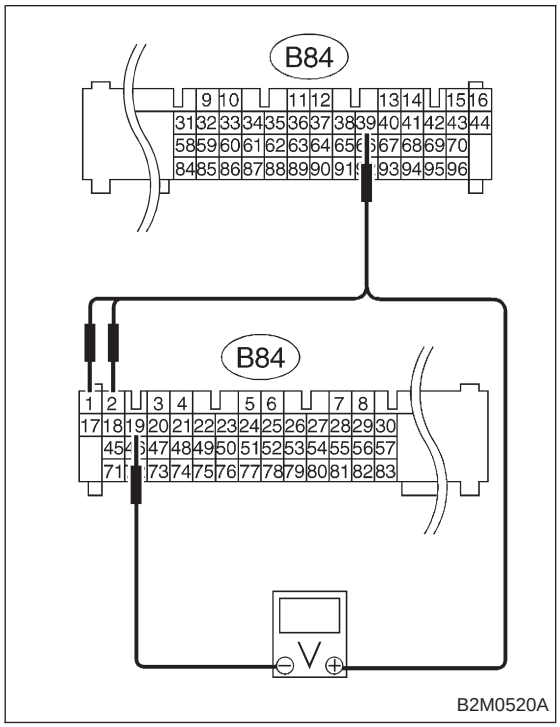
YES : Go to next CHECK .

YES : Replace main relay.

CHECK : ***Terminals***
No. 4 — No. 6:
Is the resistance less than 10 Ω?

YES : Go to step **8C2**.

NO : Replace main relay.



8C2	CHECK POWER SUPPLY CIRCUIT OF ECM.

1) Install main relay.
2) Disconnect connectors from ECM.
3) Turn ignition switch to ON.
4) Measure power supply voltage between ECM connector terminals.

CHECK : ***Connector & terminal***
(B84) No. 1 (+) — No. 19 (−):
Is the voltage more than 10 V?

YES : Go to next CHECK .

NO : Repair open or ground short circuit in harness of power supply circuit.

CHECK : ***Connector & terminal***
(B84) No. 2 (+) — No. 19 (−):
Is the voltage more than 10 V?

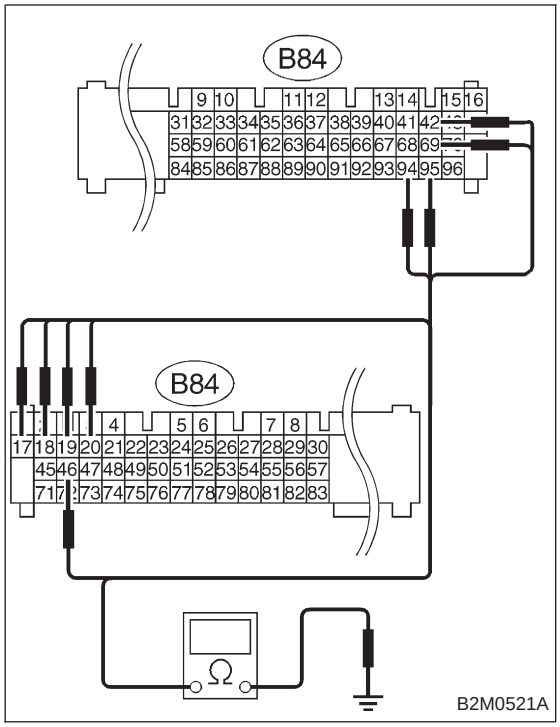
YES : Go to next CHECK .

NO : Repair open or ground short circuit in harness of power supply circuit.

CHECK : ***Connector & terminal***
(B84) No. 39 (+) — No. 19 (−):
Is the voltage more than 10 V?

YES : Go to step **8C3**.

NO : Repair open or ground short circuit in harness of power supply circuit.



8C3	CHECK GROUND CIRCUIT OF ECM.

1) Turn ignition switch to OFF.
2) Measure resistance of harness connector between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 17 — Chassis ground: Is the resistance less than 5 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

CHECK ***: Connector & terminal (B84) No. 18 — Chassis ground: Is the resistance less than 5 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

CHECK ***: Connector & terminal (B84) No. 19 — Chassis ground: Is the resistance less than 5 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

CHECK ***: Connector & terminal (B84) No. 20 — Chassis ground: Is the resistance less than 5 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

CHECK ***: Connector & terminal (B84) No. 42 — Chassis ground: Is the resistance less than 5 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

CHECK ***: Connector & terminal (B84) No. 46 — Chassis ground: Is the resistance less than 5 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

CHECK ***: Connector & terminal (B84) No. 69 — Chassis ground: Is the resistance less than 5 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

CHECK ***: Connector & terminal (B84) No. 94 — Chassis ground: Is the resistance less than 5 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

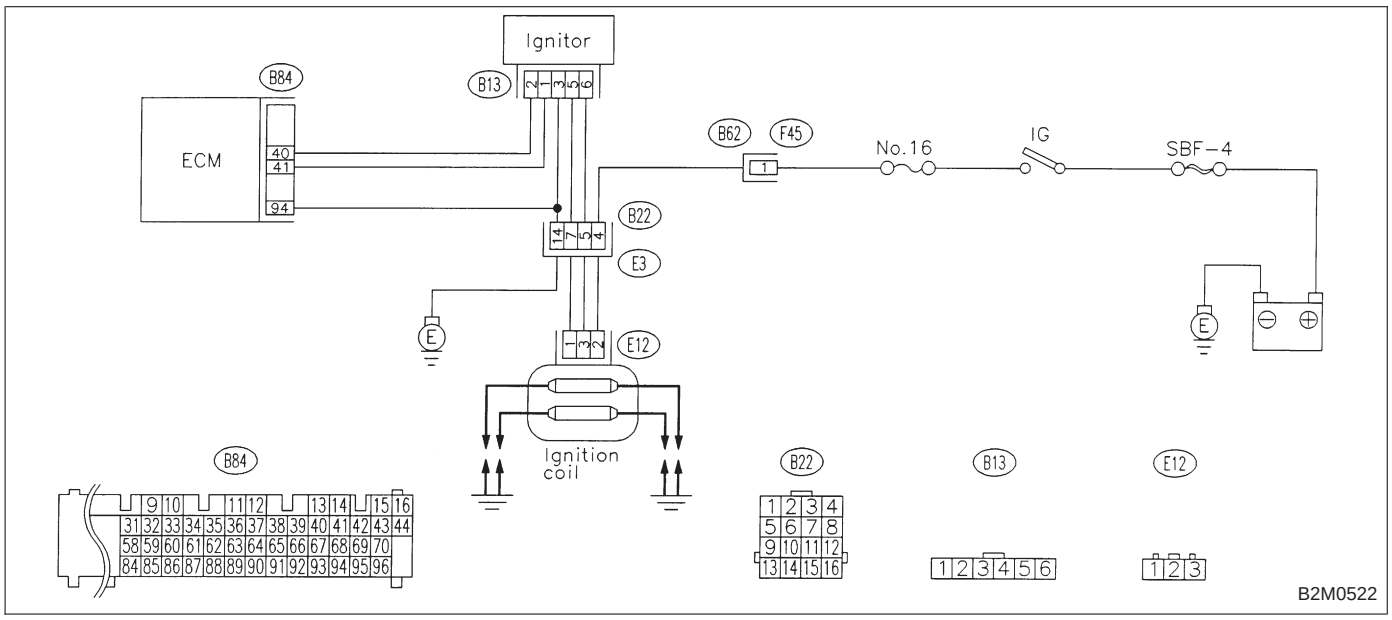
CHECK ***: Connector & terminal (B84) No. 95 — Chassis ground: Is the resistance less than 5 Ω?***

YES : Check ignition control system. <Ref. to 2-7 [T8D0].>

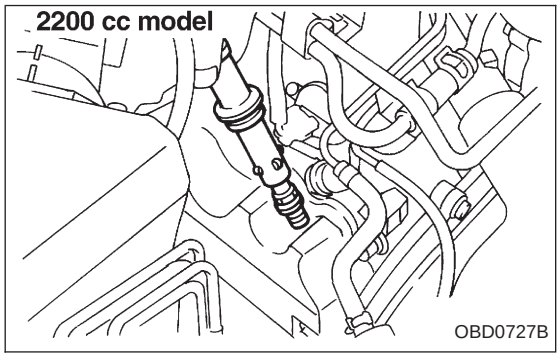
NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

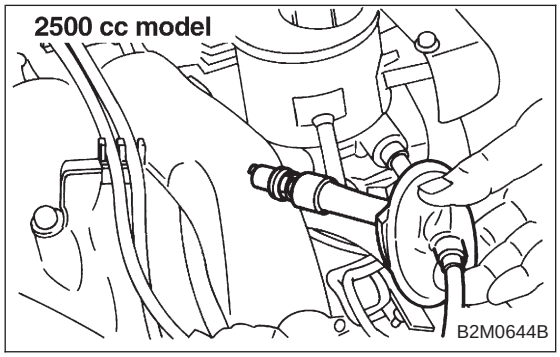
D: IGNITION CONTROL SYSTEM

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>





8D1	CHECK IGNITION SYSTEM FOR SPARKS.

1) Remove plug cord cap from each spark plug.
2) Install new spark plug on plug cord cap.

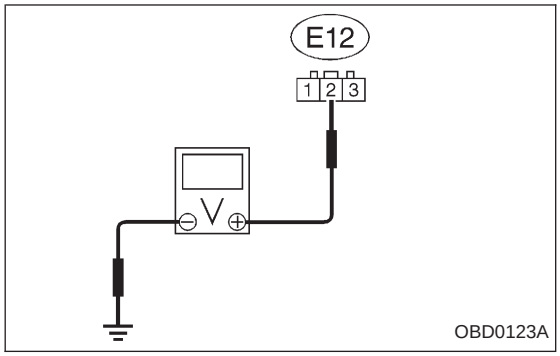
CAUTION:
Do not remove spark plug from engine.

3) Contact spark plug's thread portion on engine.
4) While opening throttle valve fully, crank engine to check that spark occurs at each cylinder.

CHECK ***: Does spark occur at each cylinder?***

YES : Check fuel pump system. <Ref. to 2-7 [T8E0], [T8F0].>

NO : Go to step **8D2**.



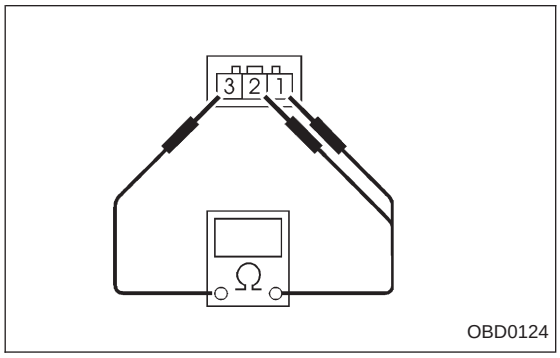
8D2	CHECK POWER SUPPLY CIRCUIT FOR IGNITION COIL.

1) Turn ignition switch to OFF.
2) Disconnect connector from ignition coil.
3) Turn ignition switch to ON.
4) Measure power supply voltage between ignition coil connector and engine ground.

CHECK ***: Connector & terminal***
(E12) No. 2 (+) — Engine ground (−):
Is the voltage more than 10 V?

YES : Go to step **8D3**.

NO : Repair open or ground short circuit in harness between ignition coil and ignition switch connector.



8D3	CHECK IGNITION COIL.

1) Measure resistance between ignition coil terminals to check primary coil.

CHECK ***: Terminals***
No. 2 — No. 1:
Is the resistance between 0.4 and 1.0 Ω?

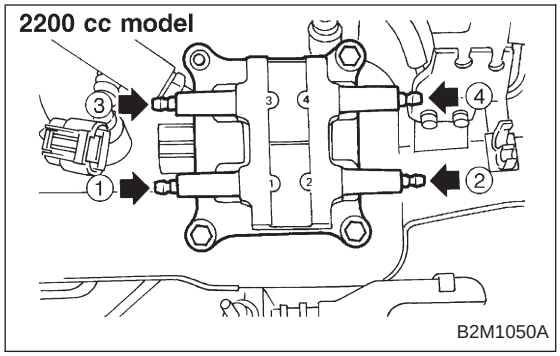
YES : Go to next CHECK .

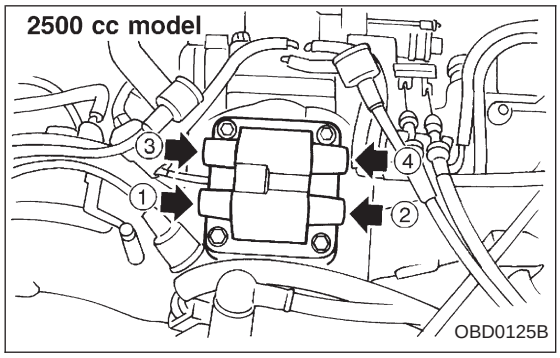
NO : Replace ignition coil.

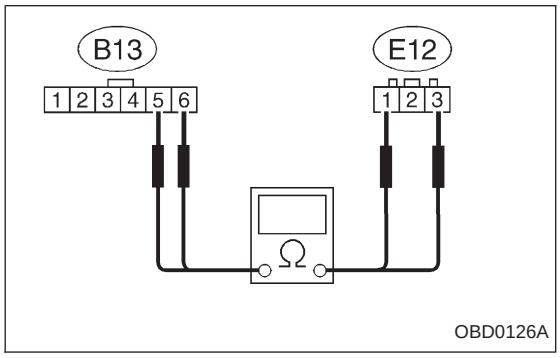
CHECK ***: Terminals***
No. 2 — No. 3:
Is the resistance between 0.4 and 1.0 Ω?

NO : Replace ignition coil.

YES : Go to next step 2).







2) Measure resistance between spark plug cord contact portions to check secondary coil.

CHECK : ***Terminals #1 — #2:***
- ***2200 cc model***
  Is the resistance between 10 and 15 kΩ?
- ***2500 cc model***
  Is the resistance between 18 and 24 kΩ?

YES : Go to next CHECK .

NO : Replace ignition coil.

CHECK : ***Terminals #3 — #4:***
- ***2200 cc model***
  Is the resistance between 10 and 15 kΩ?
- ***2500 cc model***
  Is the resistance between 18 and 24 kΩ?

YES : Go to step **8D4**.

NO : Replace ignition coil.

8D4	CHECK HARNESS BETWEEN IGNITOR AND IGNITION COIL CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from ignitor.
3) Measure resistance of harness connector between ignition coil and ignitor.

CHECK : ***Connector & terminal (B13) No. 5 — (E12) No. 1: Is the resistance less than 1 Ω?***

YES : Go to next CHECK1 .

YES : Go to next CHECK2 .

CHECK1 : ***Connector & terminal (B13) No. 6 — (E12) No. 3: Is the resistance less than 1 Ω?***

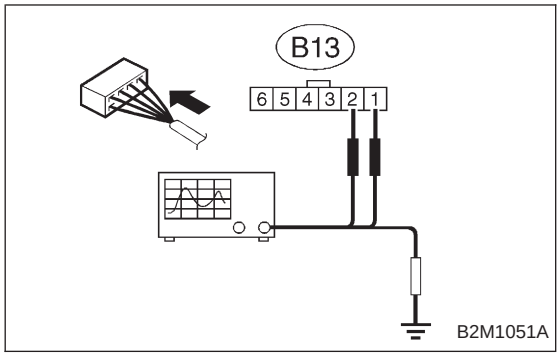
YES : Go to step **8D5**.

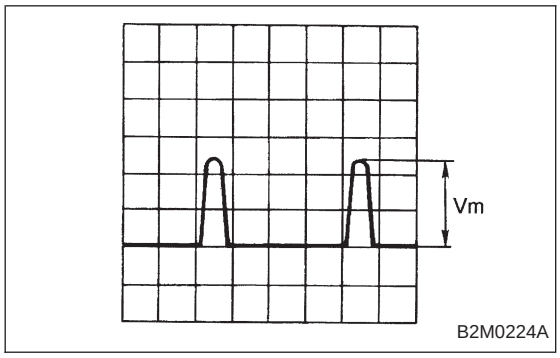
NO : Go to next CHECK2 .

CHECK2 : ***Is there poor contact in coupling connector (B22)?***

YES : Repair poor contact in coupling connector.

NO : Repair open circuit in harness between ignition coil and ignitor connector.





8D5	CHECK INPUT SIGNAL FOR IGNITOR.

Check if voltage varies synchronously with engine speed when cranking, while monitoring voltage between ignitor connector and engine ground.

CHECK ***: Connector & terminal:***
(B13) No. 1 (+) — Engine ground (−):
Is the voltage more than 10 V?

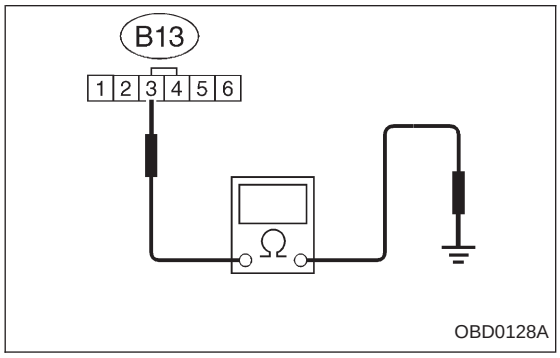
YES : Go to next CHECK .

NO : Replace ignitor.

CHECK ***: Connector & terminal:***
(B13) No. 2 (+) — Engine ground (−):
Is the voltage more than 10 V?

YES : Go to step **8D6**.

NO : Replace ignitor.



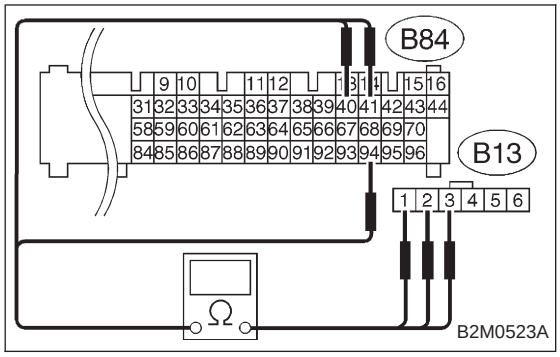
8D6	CHECK HARNESS OF IGNITOR GROUND CIRCUIT.

1) Turn ignition switch to OFF.
2) Measure resistance between ignitor and engine ground.

CHECK ***: Connector & terminal***
(B13) No. 3 — Engine ground:
Is the resistance less than 5 Ω?

YES : Go to step **8D7**.

NO : Repair open circuit in harness between ignitor connector and engine grounding terminal.



8D7	CHECK HARNESS BETWEEN ECM AND IGNITOR CONNECTOR.

1) Disconnect connector from ECM.
2) Measure resistance of harness connector between ECM and ignitor.

CHECK ***: Connector & terminal (B84) No. 41 — (B13) No. 1: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM and ignitor connector.

CHECK ***: Connector & terminal (B84) No. 40 — (B13) No. 2: Is the resistance less than 1 Ω?***

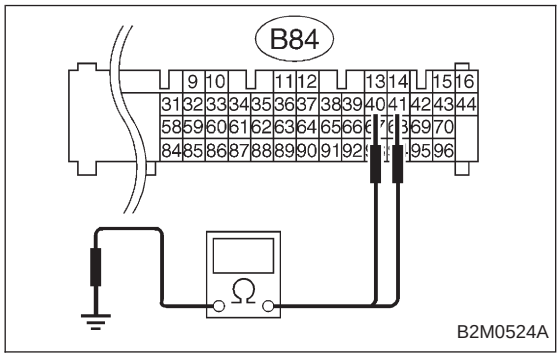
YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM and ignitor connector.

CHECK ***: Connector & terminal (B84) No. 94 — (B13) No. 3: Is the resistance less than 1 Ω?***

NO : Repair open circuit in harness between ECM and ignitor connector.

YES : Go to next step 3).



3) Measure resistance of harness connector between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 41 — Chassis ground: Is the resistance more than 1 MΩ?***

YES : Go to next CHECK .

NO : Repair ground short circuit in harness between ECM and ignitor connector.

CHECK ***: Connector & terminal (B84) No. 40 — Chassis ground: Is the resistance more than 1 MΩ?***

YES : Go to next CHECK .

NO : Repair ground short circuit in harness between ECM and ignitor connector.

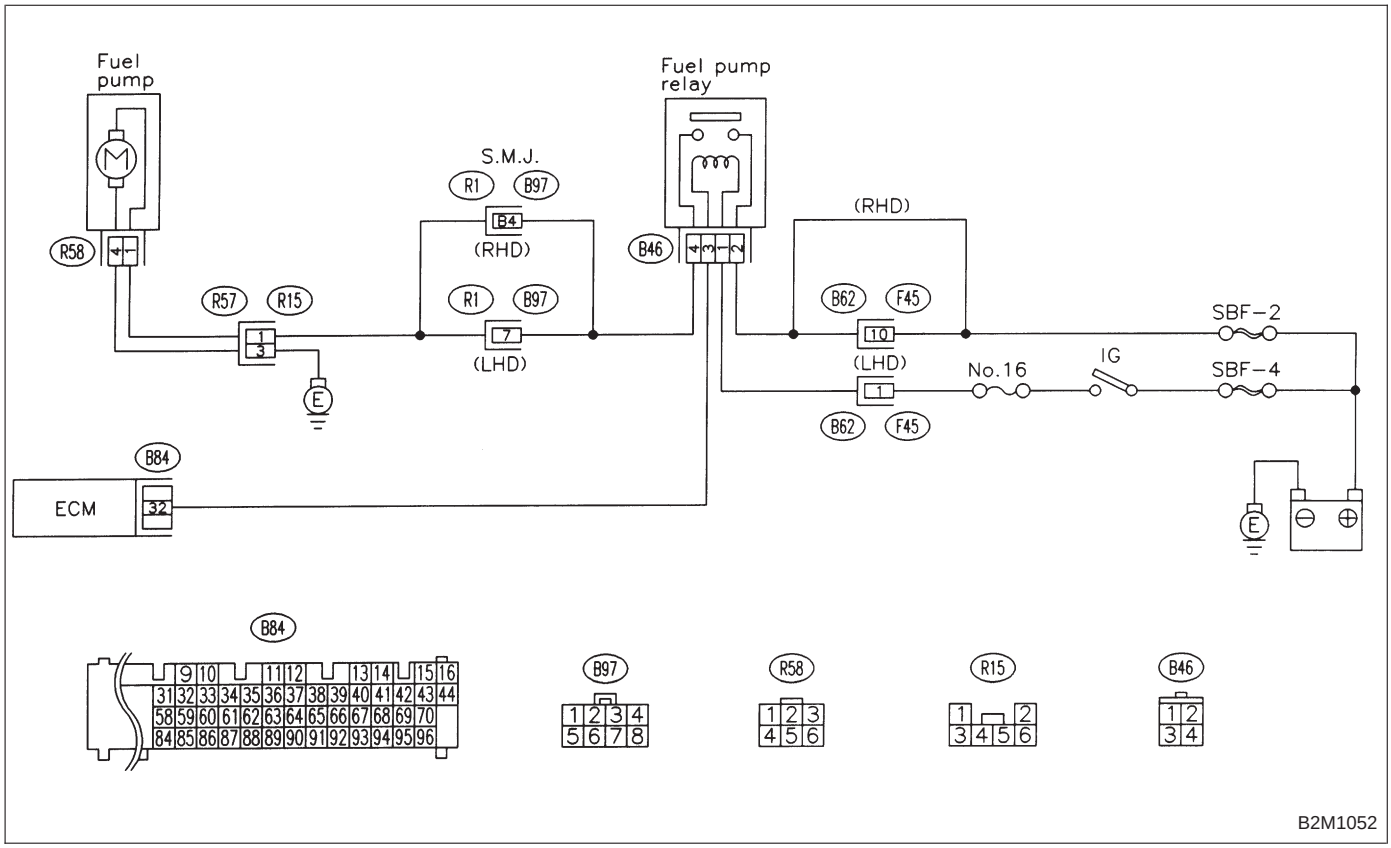
CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Check fuel pump circuit. <Ref. to 2-7 [T8E0], [T8F0].>

E: FUEL PUMP CIRCUIT (2200 cc FWD, 2500 cc AWD TAIWAN SPEC. VEHICLES)

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

8E1	CHECK OPERATING SOUND OF FUEL PUMP.

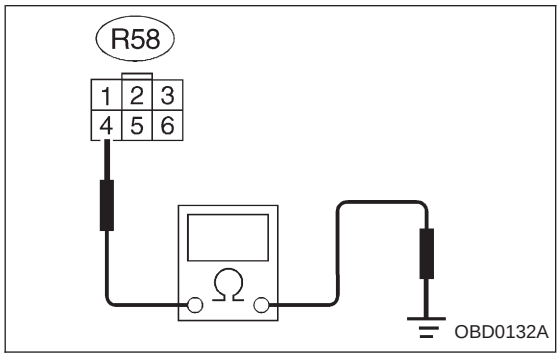
Make sure that fuel pump is in operation for two seconds when turning ignition switch to ON.

CHECK ***: Does fuel pump produce operating sound?***

NOTE:
Fuel pump operation check can also be executed using Subaru Select Monitor (Function mode: FD01).
For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Check fuel injector circuit. <Ref. to 2-7 [T8G0].>

NO : Go to step **8E2**.



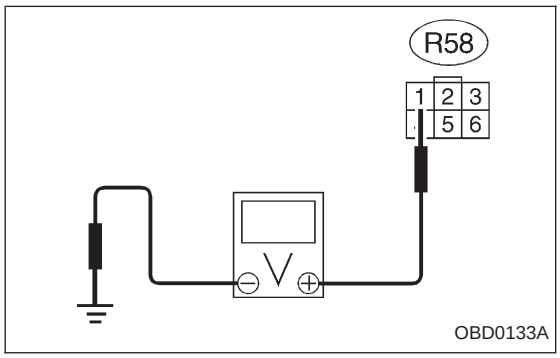
8E2	CHECK GROUND CIRCUIT OF FUEL PUMP.

1) Turn ignition switch to OFF.
2) Disconnect connector from fuel pump.
3) Measure resistance of harness connector between fuel pump and chassis ground.

CHECK ***: Connector & terminal***
(R58) No. 4 — Chassis ground:
Is the resistance less than 5 Ω?

YES : Go to step **8E3**.

NO : Repair open circuit in fuel pump ground circuit.



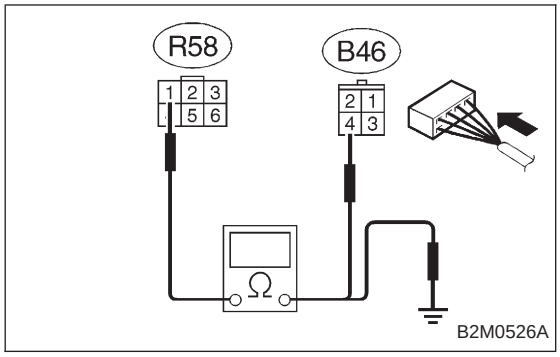
8E3	CHECK POWER SUPPLY TO FUEL PUMP.

1) Turn ignition switch to ON.
2) Measure voltage of power supply circuit between fuel pump connector and chassis ground.

CHECK ***: Connector & terminal***
(R58) No. 1 (+) — Chassis ground (−):
Is the voltage more than 10 V?

YES : Replace fuel pump.

NO : Go to step **8E4**.



8E4	CHECK HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR.

1) Turn ignition switch to OFF.
2) Measure resistance of harness connector between fuel pump and fuel pump relay.

CHECK : ***Connector & terminal (R58) No. 1 — (B46) No. 4: Is the resistance less than 1 Ω?***

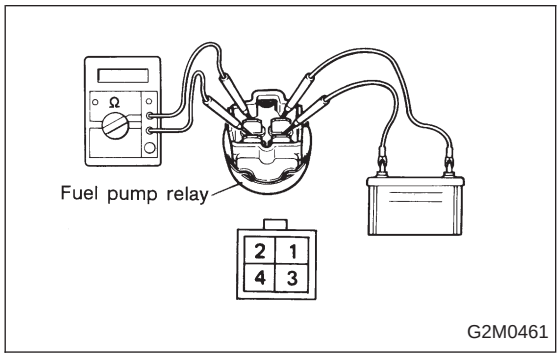
YES : Go to next CHECK .

NO : Repair open circuit in harness between fuel pump and fuel pump relay connector.

CHECK : ***Connector & terminal (R58) No. 1 — Chassis ground: Is the resistance more than 1 MΩ?***

YES : Go to step **8E5**.

NO : Repair short circuit in harness between fuel pump and fuel pump relay connector.



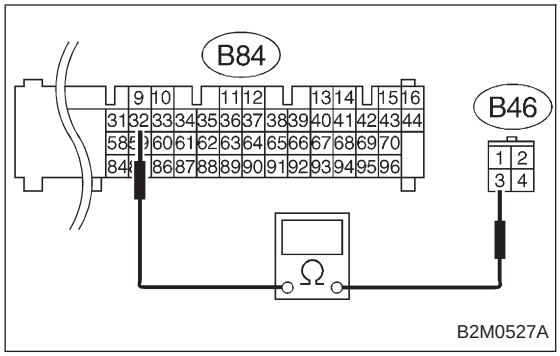
8E5	CHECK FUEL PUMP RELAY.

1) Disconnect connectors from fuel pump relay and main relay.
2) Remove fuel pump relay and main relay with bracket.
3) Connect battery to fuel pump relay connector terminals No. 1 and No. 3.
4) Measure resistance between connector terminals of fuel pump relay.

CHECK : ***Terminals No. 2 — No. 4: Is the resistance less than 10 Ω?***

YES : Go to step **8E6**.

NO : Replace fuel pump relay.



8E6	CHECK HARNESS BETWEEN ECM AND FUEL PUMP RELAY CONNECTOR.

1) Disconnect connectors from ECM.
2) Measure resistance of harness between ECM and fuel pump relay connector.

CHECK ***: Connector & terminal (B84) No. 32 — (B46) No. 3: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM and fuel pump relay connector.

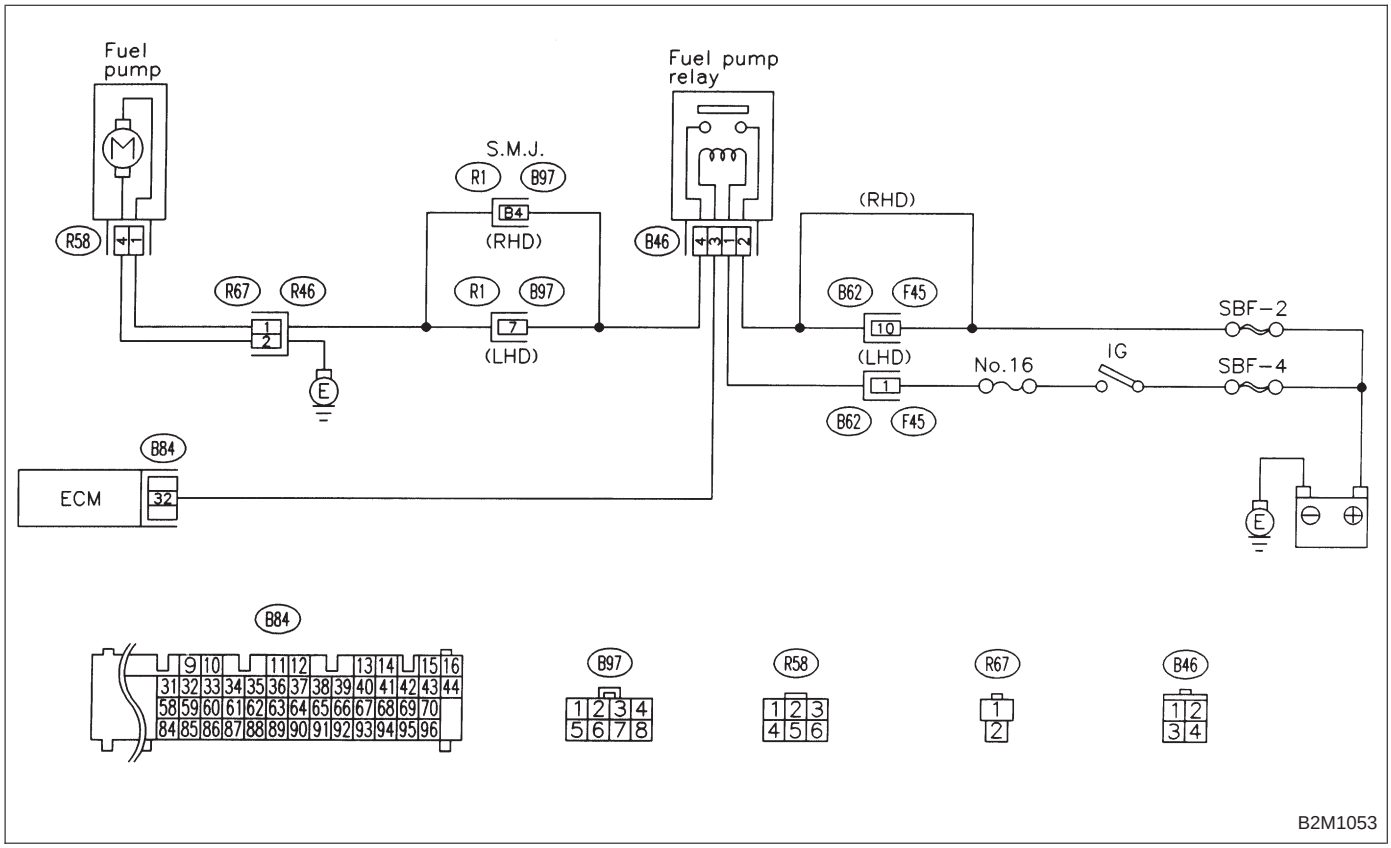
CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Check fuel injector circuit. <Ref. to 2-7 [T8G0].>

F: FUEL PUMP CIRCUIT (2200 cc AWD EXCEPT TAIWAN SPEC. VEHICLES)

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

8F1	CHECK OPERATING SOUND OF FUEL PUMP.

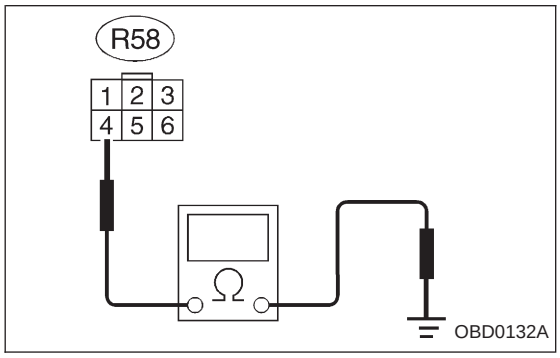
Make sure that fuel pump is in operation for two seconds when turning ignition switch to ON.

CHECK ***: Does fuel pump produce operating sound?***

NOTE:
Fuel pump operation check can also be executed using Subaru Select Monitor (Function mode: FD01).
For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Check fuel injector circuit. <Ref. to 2-7 [T8G0].>

NO : Go to step **8F2**.



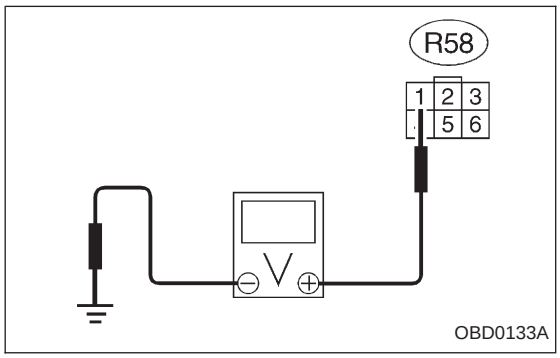
8F2	CHECK GROUND CIRCUIT OF FUEL PUMP.

1) Turn ignition switch to OFF.
2) Disconnect connector from fuel pump.
3) Measure resistance of harness connector between fuel pump and chassis ground.

CHECK ***: Connector & terminal***
(R58) No. 4 — Chassis ground:
Is the resistance less than 5 Ω?

YES : Go to step **8F3**.

NO : Repair open circuit in fuel pump ground circuit.



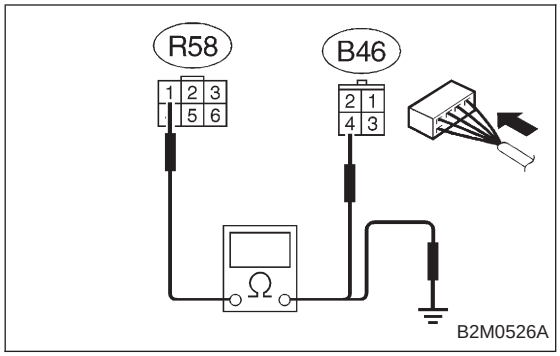
8F3	CHECK POWER SUPPLY TO FUEL PUMP.

1) Turn ignition switch to ON.
2) Measure voltage of power supply circuit between fuel pump connector and chassis ground.

CHECK ***: Connector & terminal***
(R58) No. 1 (+) — Chassis ground (−):
Is the voltage more than 10 V?

YES : Replace fuel pump.

NO : Go to step **8F4**.



8F4	CHECK HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR.

1) Turn ignition switch to OFF.
2) Measure resistance of harness connector between fuel pump and fuel pump relay.

CHECK : ***Connector & terminal (R58) No. 1 — (B46) No. 4: Is the resistance less than 1 Ω?***

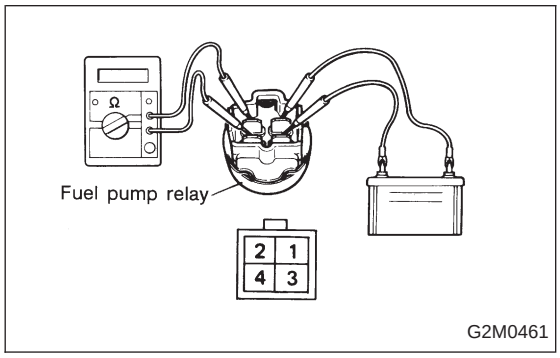
YES : Go to next CHECK .

NO : Repair open circuit in harness between fuel pump and fuel pump relay connector.

CHECK : ***Connector & terminal (R58) No. 1 — Chassis ground: Is the resistance more than 1 MΩ?***

YES : Go to step **8F5**.

NO : Repair short circuit in harness between fuel pump and fuel pump relay connector.



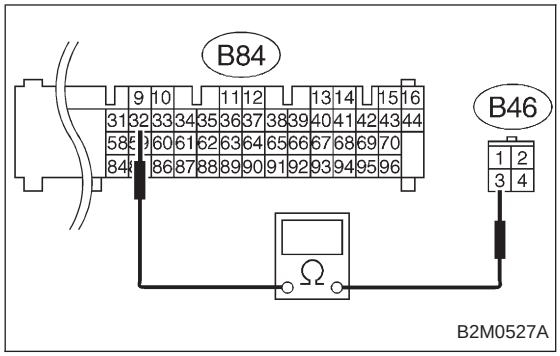
8F5	CHECK FUEL PUMP RELAY.

1) Disconnect connectors from fuel pump relay and main relay.
2) Remove fuel pump relay and main relay with bracket.
3) Connect battery to fuel pump relay connector terminals No. 1 and No. 3.
4) Measure resistance between connector terminals of fuel pump relay.

CHECK : ***Terminals No. 2 — No. 4: Is the resistance less than 10 Ω?***

YES : Go to step **8F6**.

NO : Replace fuel pump relay.



8F6	CHECK HARNESS BETWEEN ECM AND FUEL PUMP RELAY CONNECTOR.

1) Disconnect connectors from ECM.
2) Measure resistance of harness between ECM and fuel pump relay connector.

CHECK ***: Connector & terminal (B84) No. 32 — (B46) No. 3: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM and fuel pump relay connector.

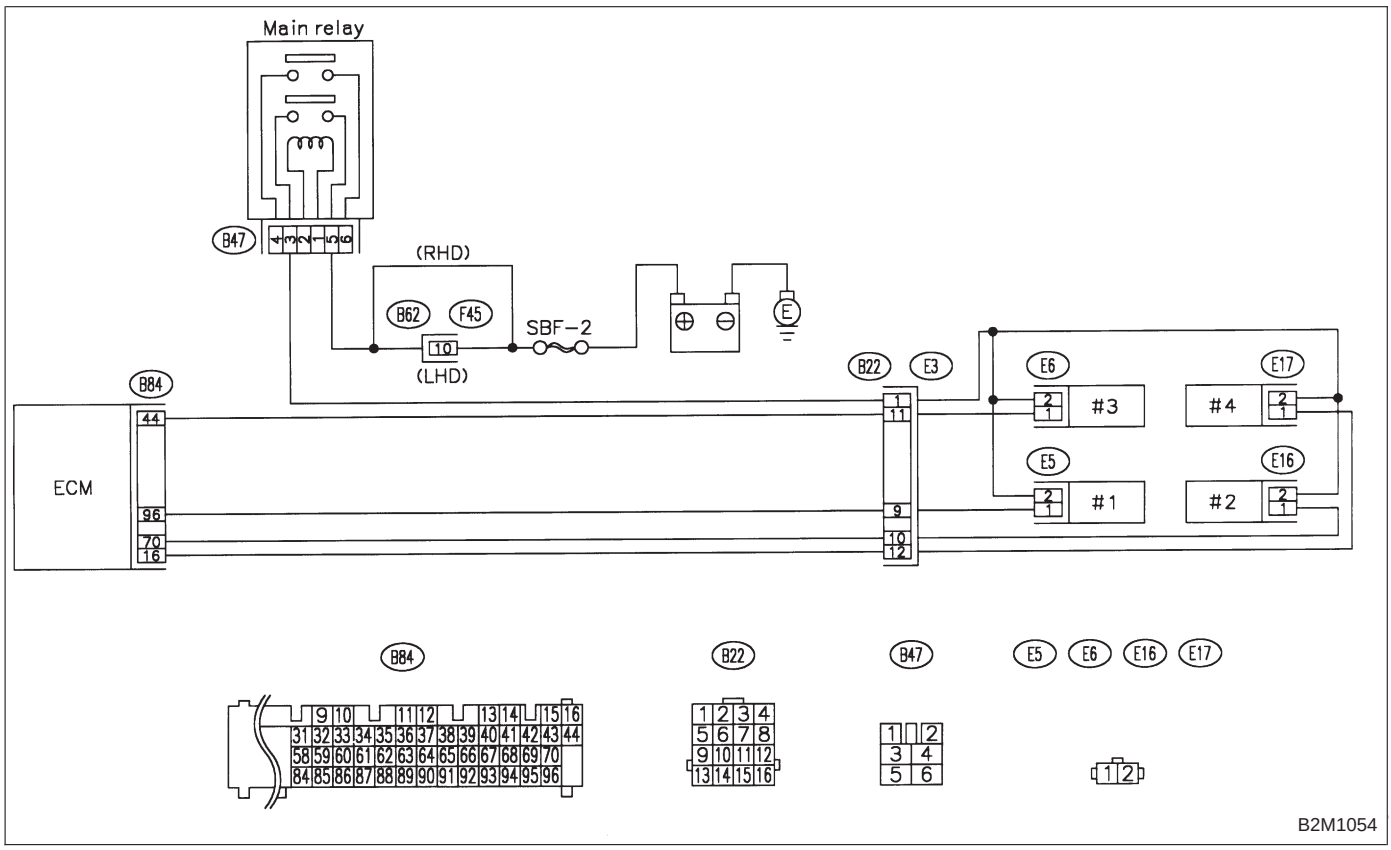
CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Check fuel injector circuit. <Ref. to 2-7 [T8G0].>

G: FUEL INJECTOR CIRCUIT

WIRING DIAGRAM:



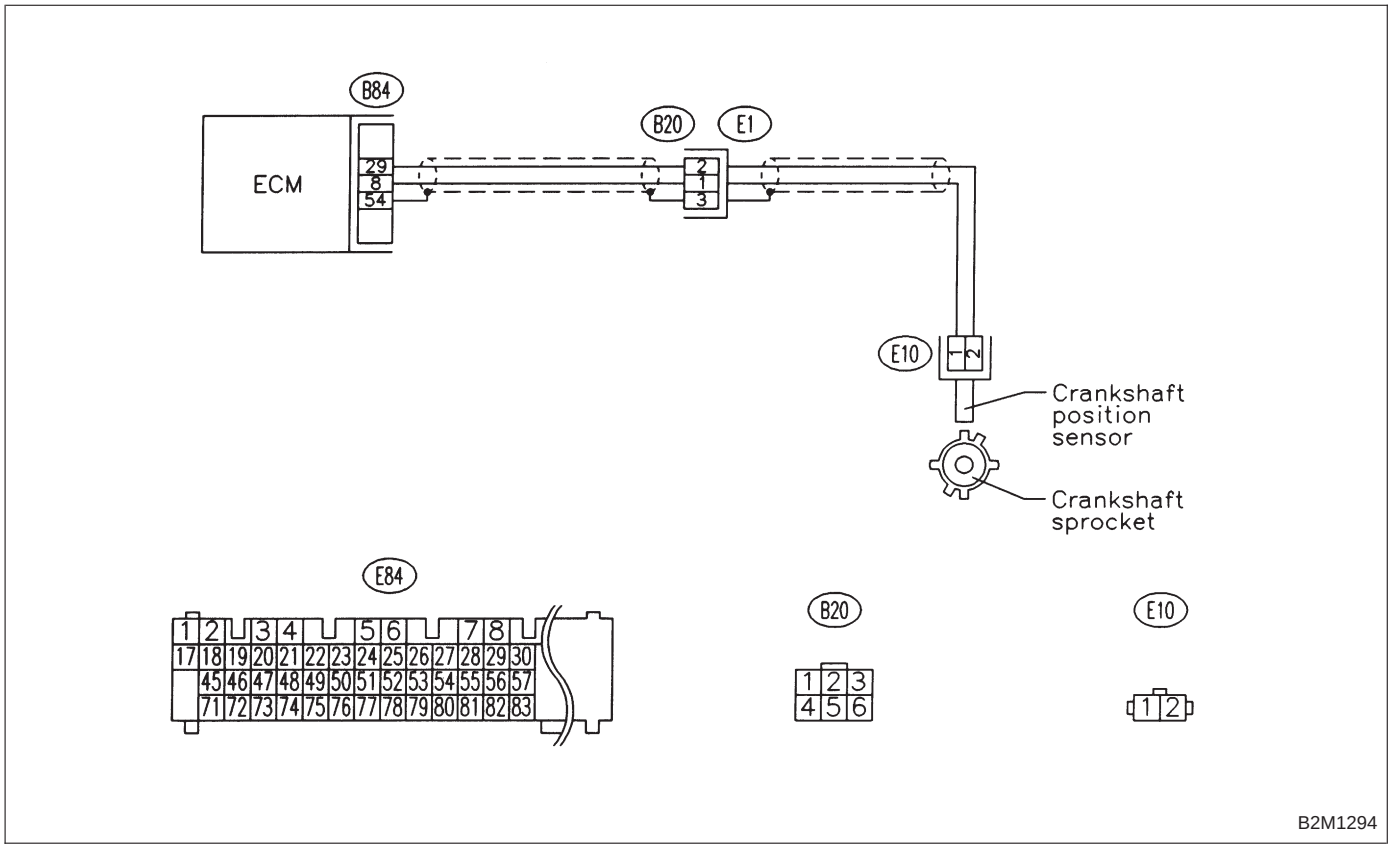
CAUTION:
- **Check or repair only faulty parts.**
- **After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.**

<Ref. to 2-7 [T3D0] and [T3E0].>

NOTE:
Check fuel injector circuit. <Ref. to 2-7 [T10AA0] or [T10AE0], [T11AA0] or [T11AE0].>

H: CRANKSHAFT POSITION SENSOR CIRCUIT

WIRING DIAGRAM:

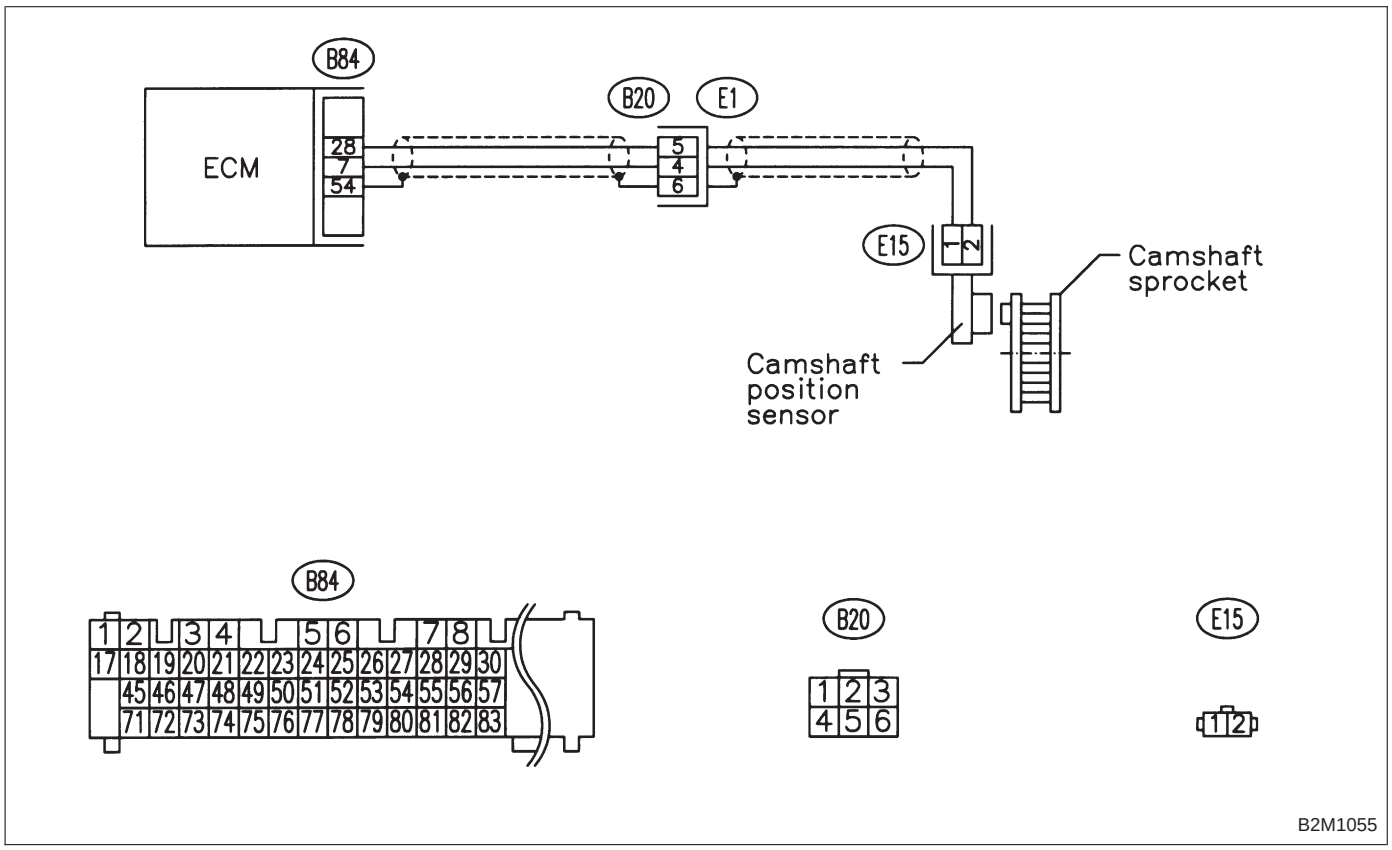


CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

NOTE:
Check crankshaft position sensor circuit. <Ref. to 2-7 [T10AK0], [T11AK0].>

I: CAMSHAFT POSITION SENSOR CIRCUIT

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

NOTE:
Check camshaft position sensor circuit. <Ref. to 2-7 [T10AM0], [T11AM0].>

9. General Diagnostic Table

A: GENERAL DIAGNOSTICS TABLE WITH NONCONFORMITY SYMPTOM FOR ENGINE

NOTE:
Malfunction of parts other than those listed is also possible.
<Ref. to 2-3 [K100], 2-3b [K100].>

Symptom	Problem parts
1. Engine stalls during idling.	1) Idle air control solenoid valve 2) Mass air flow sensor 3) Ignition parts (*1) 4) Engine coolant temperature sensor (*2) 5) Crankshaft position sensor (*3) 6) Camshaft position sensor (*3) 7) EGR valve 8) Fuel injection parts (*4)
2. Rough idling	1) Idle air control solenoid valve 2) Mass air flow sensor 3) Engine coolant temperature sensor (*2) 4) Ignition parts (*1) 5) Air intake system (*5) 6) Fuel injection parts (*4) 7) Throttle position sensor 8) Crankshaft position sensor (*3) 9) Camshaft position sensor (*3) 10) EGR valve 11) Oxygen sensor 12) Fuel pump and fuel pump relay
3. Engine does not return to idle.	1) Idle air control solenoid valve 2) Engine coolant temperature sensor 3) Accelerator cable (*6) 4) Throttle position sensor 5) Mass air flow sensor
4. Poor acceleration	1) Mass air flow sensor 2) Throttle position sensor 3) Fuel injection parts (*4) 4) Fuel pump and fuel pump relay 5) Engine coolant temperature sensor (*2) 6) Crankshaft position sensor (*3) 7) Camshaft position sensor (*3) 8) A/C switch and A/C cut relay 9) Engine torque control signal circuit 10) Ignition parts (*1)
5. Engine stalls or engine sags or hesitates at acceleration.	1) Mass air flow sensor 2) Engine coolant temperature sensor (*2) 3) Crankshaft position sensor (*3) 4) Camshaft position sensor (*3) 5) Purge control solenoid valve 6) EGR valve 7) Fuel injection parts (*4) 8) Throttle position sensor 9) Fuel pump and fuel pump relay
6. Surge	1) Mass air flow sensor 2) Engine coolant temperature sensor (*2) 3) Crankshaft position sensor (*3) 4) Camshaft position sensor (*3) 5) EGR valve 6) Fuel injection parts (*4) 7) Throttle position sensor 8) Fuel pump and fuel pump relay

Symptom	Problem parts
7. Spark knock	1) Mass air flow sensor 2) Engine coolant temperature sensor 3) Knock sensor 4) Fuel injection parts (*4) 5) Fuel pump and fuel pump relay
8. After burning in exhaust system	1) Mass air flow sensor 2) Engine coolant temperature sensor (*2) 3) Fuel injection parts (*4) 4) Fuel pump and fuel pump relay

*1: Check ignitor, ignition coil and spark plug.
*2: Indicate the symptom occurring only in cold temperatures.
*3: Ensure the secure installation.
*4: Check fuel injector, fuel pressure regulator and fuel filter.
*5: Inspect air leak in air intake system.
*6: Adjust accelerator cable.

B: GENERAL DIAGNOSTICS TABLE WITH NONCONFORMITY SYMPTOM FOR AUTOMATIC TRANSMISSION

Problem parts / Symptom	1 Inhibitor switch	2 Control module	3 Vehicle speed sensor 1	4 Vehicle speed sensor 2	5 Select cable	6 Select lever	7 FWD switch	8 Starter motor and harness	9 Throttle position sensor	10 Hold switch	11 Accumulator ("N" — "D")	12 Accumulator (2A)	13 Accumulator (4A)	14 Accumulator (3R)	15 ATF temperature sensor	16 Strainer	17 Duty solenoid A	18 Duty solenoid B	19 Shift solenoid 1	20 Shift solenoid 2	21 Shift solenoid 3	22 Control valve	23 Detent spring	24 Manual plate	25 Transfer clutch	26 Transfer valve	27 Transfer pipe	28 Duty solenoid C	29 Forward clutch
Starter does not rotate when select lever is in "P" or "N."; starter rotates when select lever is "R", "D", "3" or "2."	○				○	○		○																					
Abnormal noise when select lever is in "P" or "N."																○												○	
Hissing noise occurs during standing starts.																○													
Noise occurs while driving in "D_1" range.																													
Noise occurs while driving in "D_2" range.																													
Noise occurs while driving in "D_3" range.																													
Noise occurs while driving in "D_4" range.																													
Engine stalls while shifting from one range to another.																						○							
Vehicle moves when select lever is in "N."																													○
Shock occurs when select lever is moved from "N" to "D."		○									○											○							
Excessive time lag occurs when select lever is moved from "N" to "D."																						○							○
Shock occurs when select lever is moved from "N" to "R."		○											○									○							
Excessive time lag occurs when select lever is moved from "N" to "R."																						○							
Vehicle does not start in any shift range (engine revving up).																○						○							
Vehicle does not start in any shift range (engine stall).																													
Vehicle does not start in "R" range only (engine revving up).					○	○																○							
Vehicle does not start in "R" range only (engine stall).																													○
Vehicle does not start in "D" or "3" range (engine revving up).																													○
Vehicle does not start in "D", "3" or "2" range (engine revving up).																													○
Vehicle does not start in "D", "3" or "2" range (engine stall).																													
Vehicle starts in "R" range only (engine revving up).																						○							
Acceleration during standing starts is poor (high stall rpm).																						○							○
Acceleration during standing starts is poor (low stall rpm).																													
Acceleration is poor when select lever is in "D", "3" or "2" range (normal stall rpm).		○																				○							
Acceleration is poor when select lever is in "R" (normal stall rpm).																						○							
No shift occurs from 1st to 2nd gear.		○	○	○					○										○	○		○							
No shift occurs from 2nd to 3rd gear.		○																				○							
No shift occurs from 3rd to 4th gear.		○												○	○						○	○							
No "kick-down" shifts occur.		○							○																				
Engine brake is not effected when select lever is in "3" range.	○	○							○													○							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29

Overrunning clutch	Drive pinion	Crown gear	Axle shaft	Differential gear	Final gear	Seal pipe	Oil pump	High clutch	Band brake	Low & reverse clutch	Reverse clutch	One-way clutch (1-2)	One-way clutch (3-4)	Double oil seal	Input shaft	Output shaft	Planetary gear	Reduction gear	Drive plate	Torque converter one-way clutch	Lock-up facing	Lock-up damper	ATF deterioration	ATF level too high or too low	Differential gear oil level too high or too low	Engine performance	Engine speed signal	Parking brake mechanism	Problem parts
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	Symptom
																													Starter does not rotate when select lever is in “P” or “N.”; starter rotates when select lever is “R”, “D”, “3” or “2.”
							○												○					○					Abnormal noise when select lever is in “P” or “N.”
																								○					Hissing noise occurs during standing starts.
					○												○	○							○				Noise occurs while driving in “D_1” range.
					○												○	○							○				Noise occurs while driving in “D_2” range.
					○													○							○				Noise occurs while driving in “D_3” range.
					○												○	○							○				Noise occurs while driving in “D_4” range.
																						○				○			Engine stalls while shifting from one range to another.
																													Vehicle moves when select lever is in “N.”
																							○						Shock occurs when select lever is moved from “N” to “D.”
																													Excessive time lag occurs when select lever is moved from “N” to “D.”
																							○						Shock occurs when select lever is moved from “N” to “R.”
										○	○																		Excessive time lag occurs when select lever is moved from “N” to “R.”
	○	○	○	○			○								○	○	○		○					○					Vehicle does not start in any shift range (engine revving up).
																												○	Vehicle does not start in any shift range (engine stall).
										○	○																		Vehicle does not start in “R” range only (engine revving up).
									○								○												Vehicle does not start in “R” range only (engine stall).
												○																	Vehicle does not start in “D” or “3” range (engine revving up).
																													Vehicle does not start in “D”, “3” or “2” range (engine revving up).
											○																		Vehicle does not start in “D”, “3” or “2” range (engine stall).
																													Vehicle starts in “R” range only (engine revving up).
											○														○				Acceleration during standing starts is poor (high stall rpm).
							○													○						○			Acceleration during standing starts is poor (low stall rpm).
								○	○								○												Acceleration is poor when select lever is in “D”, “3” or “2” range (normal stall rpm).
○								○	○								○												Acceleration is poor when select lever is in “R” (normal stall rpm).
									○																				No shift occurs from 1st to 2nd gear.
								○					○																No shift occurs from 2nd to 3rd gear.
									○																				No shift occurs from 3rd to 4th gear.
																													No “kick-down” shifts occur.
																													Engine brake is not effected when select lever is in “3” range.
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	

Problem parts / Symptom	Inhibitor switch	Control module	Vehicle speed sensor 1	Vehicle speed sensor 2	Select cable	Select lever	FWD switch	Starter motor and harness	Throttle position sensor	Hold switch	Accumulator ("N" — "D")	Accumulator (2A)	Accumulator (4A)	Accumulator (3R)	ATF temperature sensor	Strainer	Duty solenoid A	Duty solenoid B	Shift solenoid 1	Shift solenoid 2	Shift solenoid 3	Control valve	Detent spring	Manual plate	Transfer clutch	Transfer valve	Transfer pipe	Duty solenoid C	Forward clutch
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Engine brake is not effected when select lever is in "3" or "2" range.																													
Engine brake is not effected when select lever is in "1" range.																						○							
Shift characteristics are erroneous.	○	○	○	○					○													○							
No lock-up occurs.		○							○						○							○							
Vehicle cannot be set in "D" range power mode.		○							○																				
"D" range power mode cannot be released.		○							○						○														
Parking brake is not effected.					○	○																							
Shift lever cannot be moved or is hard to move from "P" range.					○	○																							
Select lever is hard to move.					○	○																	○	○					
Select lever is too light to move (unreasonable resistance).																							○	○					
ATF spurts out.																													
Differential oil spurts out.																													
Differential oil level changes excessively.																													
Odor is produced from oil supply pipe.																									○				○
Shock occurs when select lever is moved from "1" to "2" range.		○							○			○			○		○					○							
Slippage occurs when select lever is moved from "1" to "2" range.		○							○			○			○		○					○							
Shock occurs when select lever is moved from "2" to "3" range.		○							○					○	○		○					○							
Slippage occurs when select lever is moved from "2" to "3" range.		○							○					○	○		○					○							
Shock occurs when select lever is moved from "3" to "4" range.		○							○				○		○		○					○							
Slippage occurs when select lever is moved from "3" to "4" range.		○							○				○		○		○					○							
Shock occurs when select lever is moved from "3" to "2" range.		○							○						○		○					○							
Shock occurs when select lever is moved from "D" to "1" range.		○							○						○		○					○							
Shock occurs when select lever is moved from "2" to "1" range.		○							○						○		○					○							
Shock occurs when accelerator pedal is released at medium speeds.		○							○						○		○					○							
Vibration occurs during straight-forward operation.		○																○											
Select lever slips out of position during acceleration or while driving on rough terrain.					○	○																	○	○					
Vibration occurs during turns (tight corner "braking" phenomenon).		○	○	○					○	○					○										○	○		○	
Front wheel slippage occurs during standing starts.		○		○			○		○	○					○							○			○	○	○	○	
Vehicle is not set in FWD mode.		○					○																		○	○		○	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29

1 Overrunning clutch	2 Drive pinion	3 Crown gear	4 Axle shaft	5 Differential gear	6 Final gear	7 Seal pipe	8 Oil pump	9 High clutch	10 Band brake	11 Low & reverse clutch	12 Reverse clutch	13 One-way clutch (1-2)	14 One-way clutch (3-4)	15 Double oil seal	16 Input shaft	17 Output shaft	18 Planetary gear	19 Reduction gear	20 Drive plate	21 Torque converter one-way clutch	22 Lock-up facing	23 Lock-up damper	24 ATF deterioration	25 ATF level too high or too low	26 Differential gear oil level too high or too low	27 Engine performance	28 Engine speed signal	29 Parking brake mechanism	Problem parts
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	Symptom
○																													Engine brake is not effected when select lever is in “3” or “2” range.
										○																			Engine brake is not effected when select lever is in “1” range.
																													Shift characteristics are erroneous.
																					○						○		No lock-up occurs.
																													Vehicle cannot be set in “D” range power mode.
																													“D” range power mode cannot be released.
																												○	Parking brake is not effected.
																												○	Shift lever cannot be moved or is hard to move from “P” range.
																													Select lever is hard to move.
																													Select lever is too light to move (unreasonable resistance).
																								○					ATF spurts out.
																									○				Differential oil spurts out.
						○								○															Differential oil level changes excessively.
○								○	○	○	○										○		○						Odor is produced from oil supply pipe.
									○														○			○			Shock occurs when select lever is moved from “1” to “2” range.
									○																				Slippage occurs when select lever is moved from “1” to “2” range.
								○	○														○			○			Shock occurs when select lever is moved from “2” to “3” range.
								○	○																				Slippage occurs when select lever is moved from “2” to “3” range.
○									○														○			○			Shock occurs when select lever is moved from “3” to “4” range.
									○																				Slippage occurs when select lever is moved from “3” to “4” range.
○									○														○						Shock occurs when select lever is moved from “3” to “2” range.
																							○						Shock occurs when select lever is moved from “D” to “1” range.
										○													○						Shock occurs when select lever is moved from “2” to “1” range.
																						○				○			Shock occurs when accelerator pedal is released at medium speeds.
																					○	○							Vibration occurs during straight-forward operation.
																													Select lever slips out of position during acceleration or while driving on rough terrain.
																							○						Vibration occurs during turns (tight corner “braking” phenomenon).
																													Front wheel slippage occurs during standing starts.
																													Vehicle is not set in FWD mode.
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	

10. Diagnostic Chart with Trouble Code for LHD Vehicles

A: DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC No.	Abbreviation (Subaru Select Monitor)	Item	Page
P0101	QA—RLOW	Mass air flow sensor circuit range/performance problem (low input)	132
P0102	QA—LOW	Mass air flow sensor circuit low input	134
P0103	QA—HI	Mass air flow sensor circuit high input	138
P0106	PS—R2	Pressure sensor circuit range/performance problem	141
P0107	P—SLOW	Pressure sensor circuit low input	145
P0108	P—SHI	Pressure sensor circuit high input	149
P0116	TW—LOW	Engine coolant temperature sensor circuit low input	154
P0117	TW—HI	Engine coolant temperature sensor circuit high input	157
P0121	TH—RHI	Throttle position sensor circuit range/performance problem (high input)	160
P0122	THV—LOW	Throttle position sensor circuit low input	162
P0123	THV—HI	Throttle position sensor circuit high input	167
P0125	TW—CL	Insufficient coolant temperature for closed loop fuel control	170
P0130	FO2—V	Front oxygen sensor circuit malfunction	172
P0133	FO2—R	Front oxygen sensor circuit slow response	175
P0135	FO2H	Front oxygen sensor heater circuit malfunction	177
P0136	RO2—V	Rear oxygen sensor circuit malfunction	181
P0139	RO2—R	Rear oxygen sensor circuit slow response	184
P0141	RO2H	Rear oxygen sensor heater circuit malfunction	186
P0170	FUEL	Fuel trim malfunction	190
P0181	TNKT—F	Fuel temperature sensor A circuit range/performance problem	195
P0182	TNKT—LOW	Fuel temperature sensor A circuit low input	197
P0183	TNKT—HI	Fuel temperature sensor A circuit high input	200
P0261	INJ1	Fuel injector circuit low input - #1	203
P0262	INJ1—HI	Fuel injector circuit high input - #1	207
P0264	INJ2	Fuel injector circuit low input - #2	203
P0265	INJ2—HI	Fuel injector circuit high input - #2	207
P0267	INJ3	Fuel injector circuit low input - #3	203
P0268	INJ3—HI	Fuel injector circuit high input - #3	207
P0270	INJ4	Fuel injector circuit low input - #4	203
P0271	INJ4—HI	Fuel injector circuit high input - #4	207
P0301	MIS—1	Cylinder 1 misfire detected	211
P0302	MIS—2	Cylinder 2 misfire detected	211
P0303	MIS—3	Cylinder 3 misfire detected	211
P0304	MIS—4	Cylinder 4 misfire detected	211
P0325	KNOCK	Knock sensor circuit malfunction	219
P0335	CRANK	Crankshaft position sensor circuit malfunction	222
P0336	CRANK—R	Crankshaft position sensor circuit range/performance problem	225
P0340	CAM	Camshaft position sensor circuit malfunction	227

DTC No.	Abbreviation (Subaru Select Monitor)	Item	Page
P0341	CAM—R	Camshaft position sensor circuit range/performance problem	230
P0400	EGR	Exhaust gas recirculation flow malfunction	232
P0403	EGRSOL	Exhaust gas recirculation circuit low input	237
P0420	CAT	Catalyst system efficiency below threshold	240
P0440	EVAP	Evaporative emission control system malfunction	242
P0441	CPC—F	Evaporative emission control system incorrect purge flow	246
P0443	CPC	Evaporative emission control system purge control valve circuit low input	248
P0446	VCMSOL—LO	Evaporative emission control system vent control low input	251
P0451	TNKP—F	Evaporative emission control system pressure sensor range/performance problem	254
P0452	TNKP—LOW	Evaporative emission control system pressure sensor low input	256
P0453	TNKP—HI	Evaporative emission control system pressure sensor high input	261
P0461	FLVL—R	Fuel level sensor circuit range/performance problem	267
P0462	FLVL—LOW	Fuel level sensor circuit low input	269
P0463	FLVL—HI	Fuel level sensor circuit high input	275
P0500	VSP	Vehicle speed sensor malfunction	281
P0505	ISC	Idle control system malfunction	283
P0506	ISC—RLOW	Idle control system RPM lower than expected	289
P0507	ISC—RHI	Idle control system RPM higher than expected	291
P0600	—	Serial communication link malfunction	293
P0601	RAM	Internal control module memory check sum error	295
P0703	ATBRK	Brake switch input malfunction	296
P0705	ATRNG	Transmission range sensor circuit malfunction	299
P0710	ATF	Transmission fluid temperature sensor circuit malfunction	311
P0720	ATVSP	Output speed sensor (vehicle speed sensor 1) circuit malfunction	312
P0725	ATNE	Engine speed input circuit malfunction	313
P0731	ATGR1	Gear 1 incorrect ratio	314
P0732	ATGR2	Gear 2 incorrect ratio	314
P0733	ATGR3	Gear 3 incorrect ratio	314
P0734	ATGR4	Gear 4 incorrect ratio	314
P0740	ATLU—F	Torque converter clutch system malfunction	317
P0743	ATLU	Torque converter clutch system electrical	321
P0748	ATPL	Pressure control solenoid electrical	322
P0753	ATSFT1	Shift solenoid A electrical	323
P0758	ATSFT2	Shift solenoid B electrical	324
P0760	ATOVR—F	Shift solenoid C malfunction	325
P0763	ATOVR	Shift solenoid C electrical	328
P1100	ST—SWOFF	Starter switch circuit low input	329
P1101	N—SW	Neutral position switch circuit malfunction [MT vehicles]	331
P1101	N—SWOFF	Neutral position switch circuit high input [AT vehicles]	335
P1102	BR	Pressure sources switching solenoid valve circuit low input	340
P1103	TRQ	Engine torque control signal circuit malfunction	343
P1104	TCS—LOW	TCS signal circuit low input	346

DTC No.	Abbreviation (Subaru Select Monitor)	Item	Page
P1120	ST—SWON	Starter switch circuit high input	348
P1121	N—SWON	Neutral position switch circuit low input [AT vehicles]	350
P1122	BR—HI	Pressure sources switching solenoid valve circuit high input	354
P1124	TCS—HI	TCS signal circuit high input	357
P1141	QA—RHI	Mass air flow sensor circuit range/performance problem (high input)	360
P1142	TH—RLOW	Throttle position sensor circuit range/performance problem (low input)	362
P1143	PS—RLOW	Pressure sensor circuit range/performance problem (low input)	364
P1144	PS—RHI	Pressure sensor circuit range/performance problem (high input)	368
P1400	PCVSOL—LO	Fuel tank pressure control solenoid valve circuit low input	370
P1420	PCVSOL—HI	Fuel tank pressure control solenoid valve circuit high input	374
P1421	EGRSOL—HI	Exhaust gas recirculation circuit high input	377
P1422	CPC—HI	Evaporative emission control system purge control valve circuit high input	380
P1423	VCMSOL—HI	Evaporative emission control system vent control high input	383
P1440	PCV—FLOW	Fuel tank pressure control system function problem (low input)	386
P1441	PCV—FHI	Fuel tank pressure control system function problem (high input)	390
P1442	FLVL—R2	Fuel level sensor circuit range/performance problem 2	393
P1500	FAN—1	Radiator fan relay 1 circuit low input	395
P1502	FAN—F	Radiator fan function problem	401
P1507	ISC—SHI	Idle control system malfunction (fail-safe)	403
P1520	FAN—1HI	Radiator fan relay 1 circuit high input	405
P1540	VSP—S	Vehicle speed sensor malfunction 2	407
P1700	ATTH	Throttle position sensor circuit malfunction for automatic transmission	409
P1701	ATCRS	Cruise control set signal circuit malfunction for automatic transmission	411
P1702	ATDIAG—LO	Automatic transmission diagnosis input signal circuit low input	413
P1722	ATDIAG—HI	Automatic transmission diagnosis input signal circuit high input	416
P1742	ATDIAG—2	Automatic transmission diagnosis input signal circuit malfunction	419

OBD (FB1)

P0101 <QA_RLOW>

B2M1056

B: DTC P0101 — MASS AIR FLOW SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) —

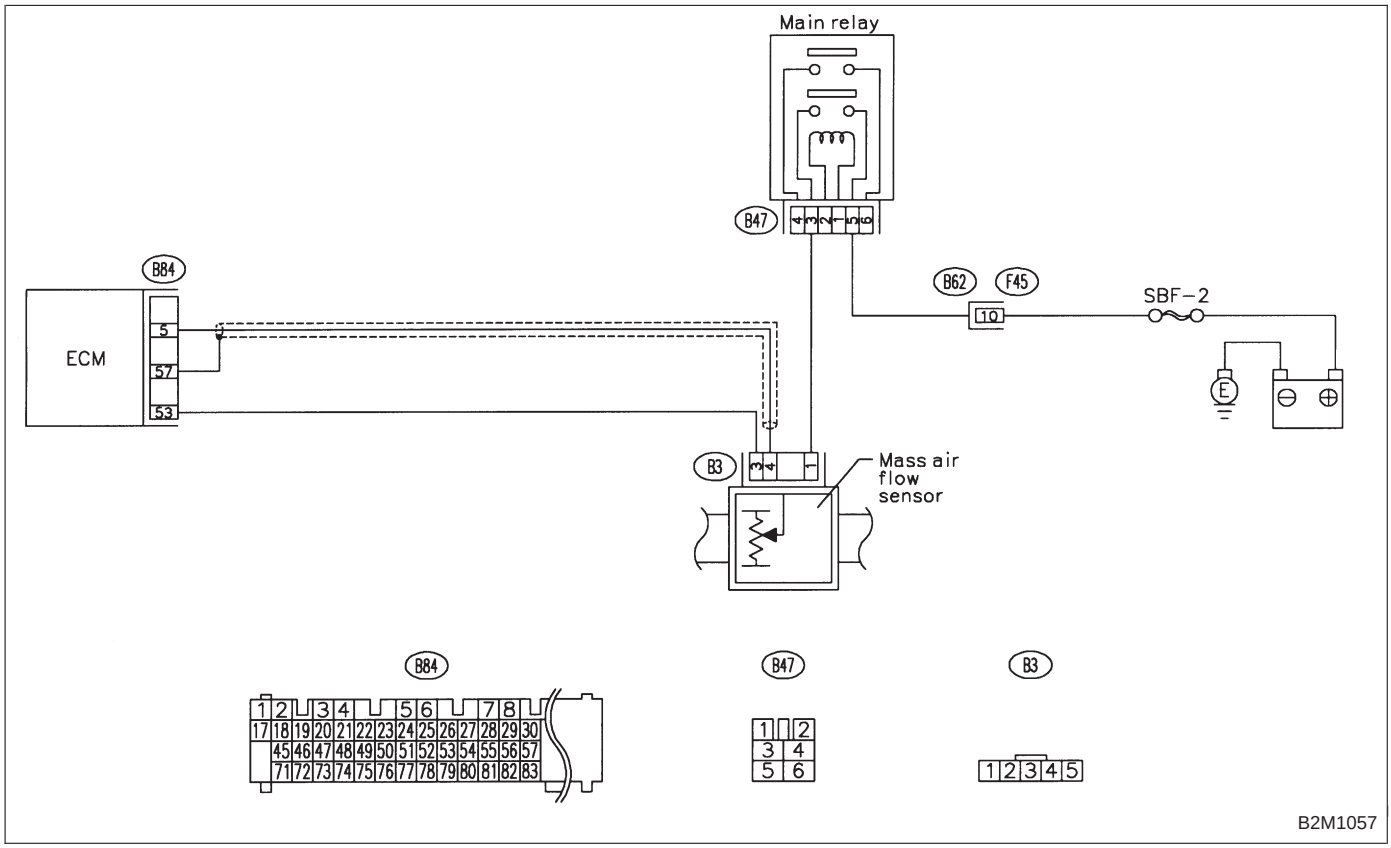
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10B1	**CHECK DTC P0102 OR P0103 ON DISPLAY.**

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0102 or P0103?***

YES : Inspect DTC P0102 or P0103 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect DTC P0101.

NO : Replace mass air flow sensor.

OBD (FB1)
P0102 <QA_LOW>
B2M1058

C: DTC P0102 — MASS AIR FLOW SENSOR CIRCUIT LOW INPUT —

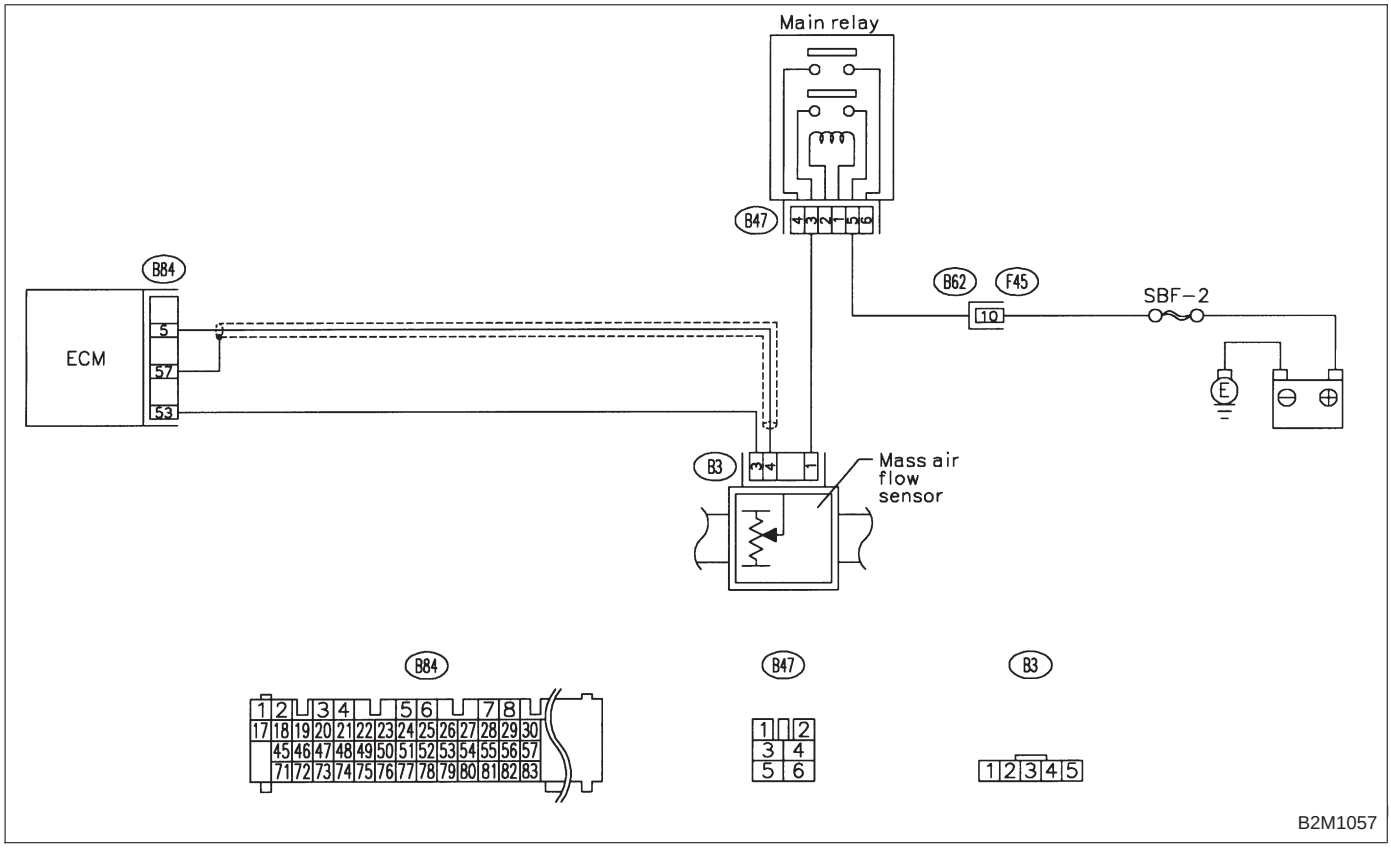
DTC DETECTING CONDITION:

- Immediately at fault recognition

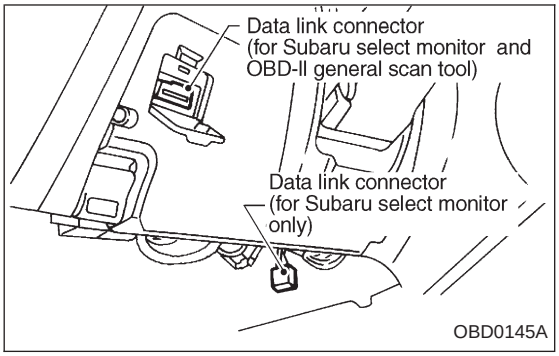
TROUBLE SYMPTOM:

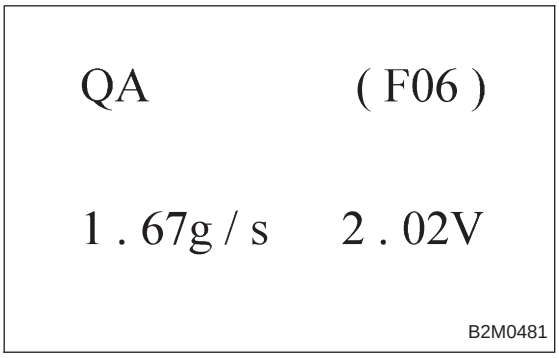
- Erroneous idling
- Engine stalls.
- Poor driving performance

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>





10C1	**CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.**

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
4) Start engine.

5) Read data on Subaru Select Monitor or OBD-II general scan tool.
● Subaru Select Monitor
Designate mode using function key.

Function mode: F06

● F06: Mass air flow and voltage input from mass air flow sensor are shown on display at the same time.

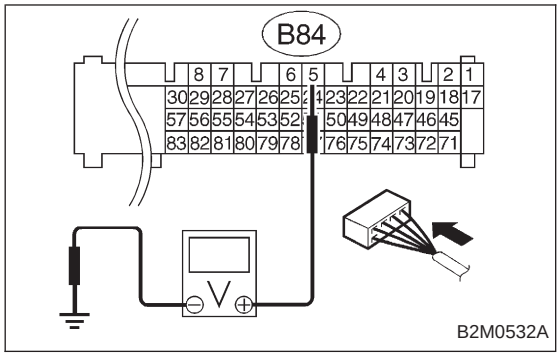
CHECK ***: Is the value equal to or more than 1.3 g/sec or 0.3 V and equal to or less than 250 g/sec or 5.0 V in function mode F06?***

Probable cause: Poor connect of connectors, circuit and grounding line.

YES : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the mass air flow sensor.

NOTE:
In this case, repair the following:
● Open or ground short circuit in harness between mass air flow sensor and ECM connector
● Poor contact in mass air flow sensor or ECM connector

NO : Go to step **10C2**.



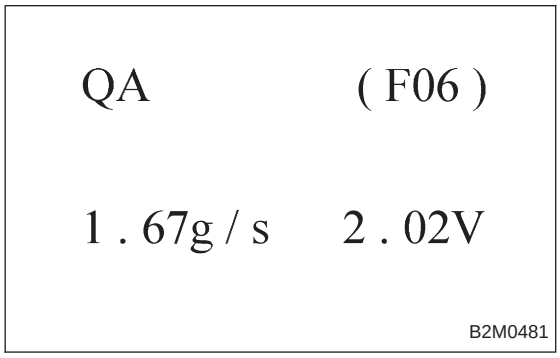
10C2	CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

Measure voltage between ECM connector and chassis ground while engine is idling.

CHECK ***: Connector & terminal (B84) No. 5 (+) — Chassis ground (−): Is the voltage less than 0.3 V?***

YES : Go to step **10C3**.

NO : Go to next CHECK .

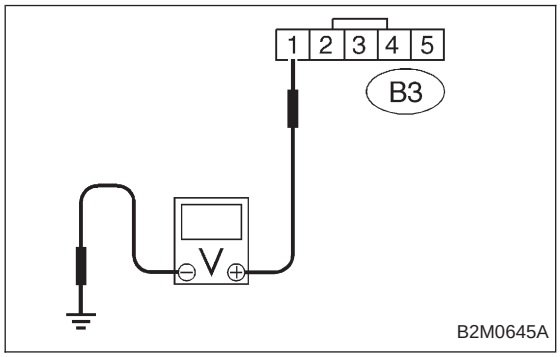


CHECK ***: Does the voltage change more than 0.3 V by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?***

YES : Repair poor contact in ECM connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.



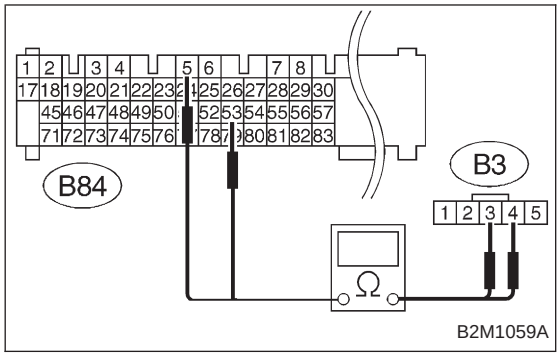
10C3	CHECK POWER SUPPLY TO MASS AIR FLOW SENSOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from mass air flow sensor.
3) Turn ignition switch to ON.
4) Measure voltage between mass air flow sensor connector and engine ground.

CHECK ***: Connector & terminal (B3) No. 1 (+) — Engine ground (−): Is the voltage more than 10 V?***

YES : Go to step **10C4**.

NO : Repair open circuit in harness between main relay and mass air flow sensor connector.



10C4	CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from ECM.
3) Measure resistance of harness between ECM and mass air flow sensor connector.

CHECK ***: Connector & terminal (B84) No. 5 — (B3) No. 4: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair harness and connector.

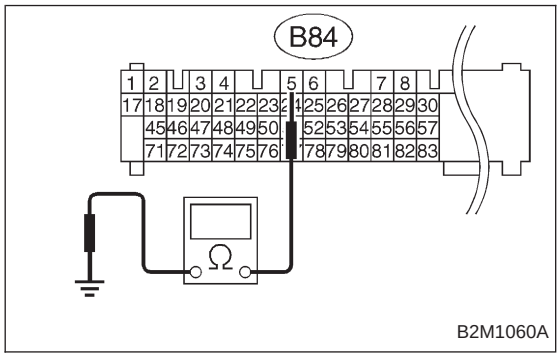
NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and mass air flow sensor connector
- Poor contact in mass air flow sensor connector
- Poor contact in ECM connector

CHECK ***: Connector & terminal (B84) No. 53 — (B3) No. 3: Is the resistance less than 1 Ω?***

YES : Go to step **10C5**.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and mass air flow sensor connector
- Poor contact in mass air flow sensor connector
- Poor contact in ECM connector



10C5	CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.

Measure resistance of harness between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 5 — Chassis ground: Is the resistance more than 1 MΩ?***

YES : Replace mass air flow sensor.

NO : Repair ground short circuit in harness between ECM and mass air flow sensor connector.

OBD (FB1)
P0103 <QA_HI>
B2M1061

D: DTC P0103 — MASS AIR FLOW SENSOR CIRCUIT HIGH INPUT —

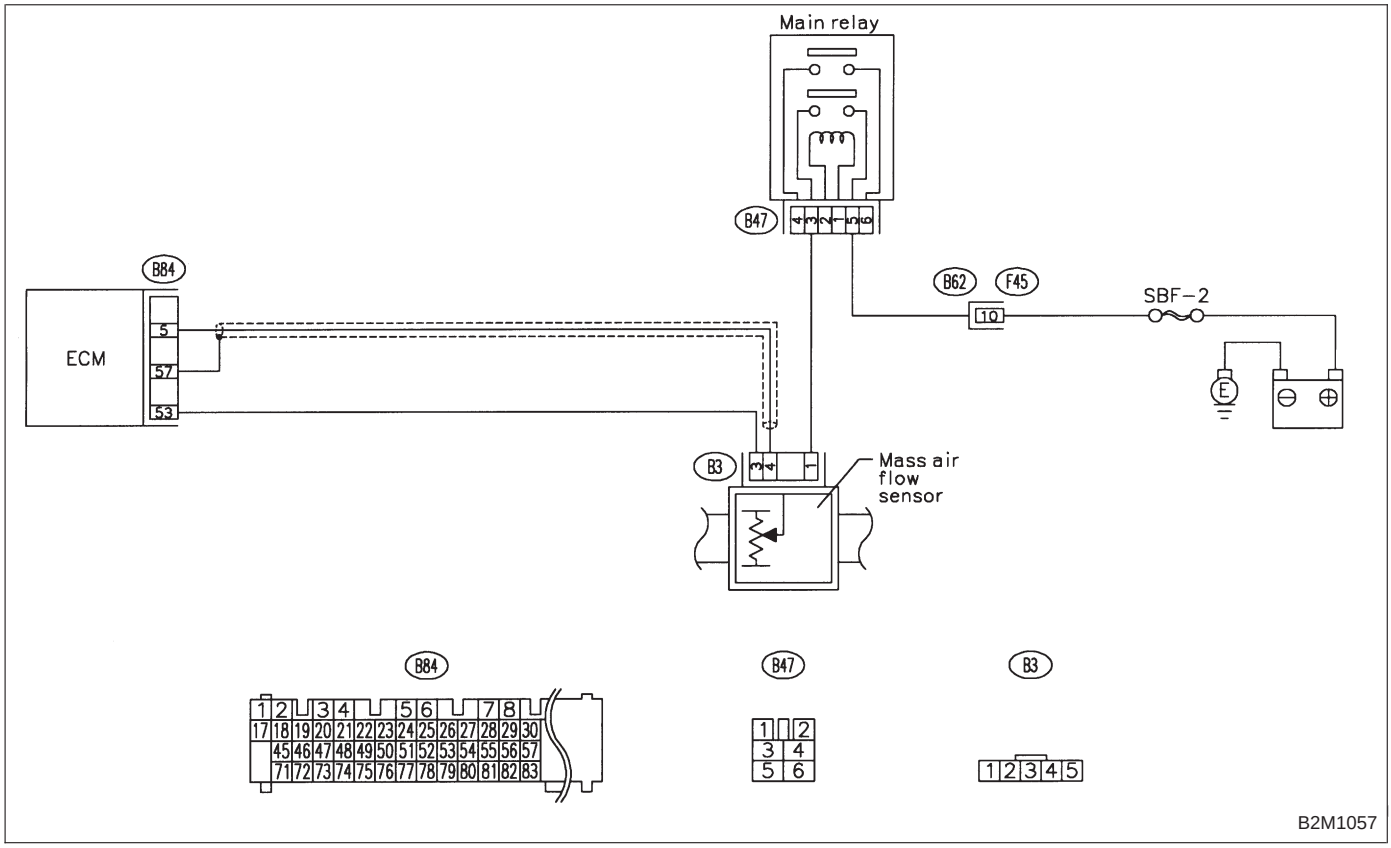
DTC DETECTING CONDITION:

- Immediately at fault recognition

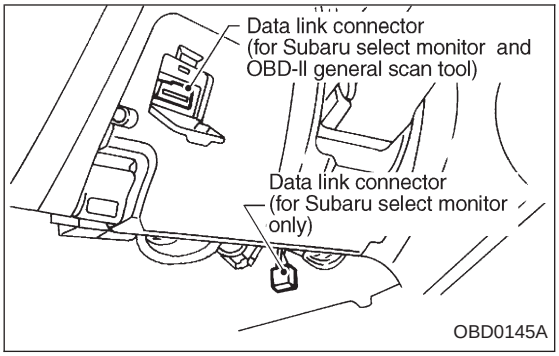
TROUBLE SYMPTOM:

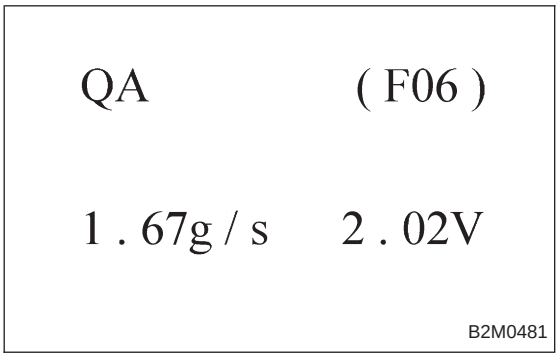
- Erroneous idling
- Engine stalls.
- Poor driving performance

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>





10D1	**CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.**

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
4) Start engine.

5) Read data on Subaru Select Monitor or OBD-II general scan tool.
● Subaru Select Monitor
Designate mode using function key.

Function mode: F06

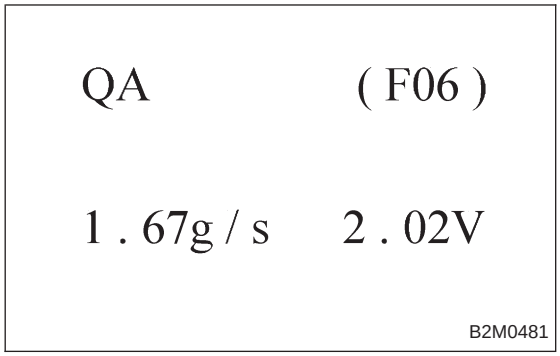
● F06: Mass air flow and voltage input from mass air flow sensor are shown on display at the same time.

CHECK ***: Is the value equal to or more than 1.3 g/sec or 0.3 V and equal to or less than 250 g/sec or 5.0 V in function mode F06?***

Probable cause: Poor connect of connectors, circuit and grounding line.

YES : Even if MIL lights up, the circuit has returned to a normal condition at this time.

NO : Go to step **10D2**.



10D2	CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.

1) Turn ignition switch to OFF and Subaru Select Monitor or the OBD-II general scan tool switch to OFF.
2) Disconnect connector from mass air flow sensor.
3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
4) Read data on Subaru select monitor or OBD-II general scan tool.

● Subaru Select Monitor

Designate mode using function key.

Function mode: F06

CHECK ***: Is the value more than 250 g/sec or 5 V in function mode F06?***

YES : Repair battery short circuit in harness between mass air flow sensor and ECM connector. After repair, replace ECM.

NO : Replace mass air flow sensor.

● OBD-II general scan tool

For detailed operation procedures, refer to OBD-II General Scan Tool Instruction Manual.

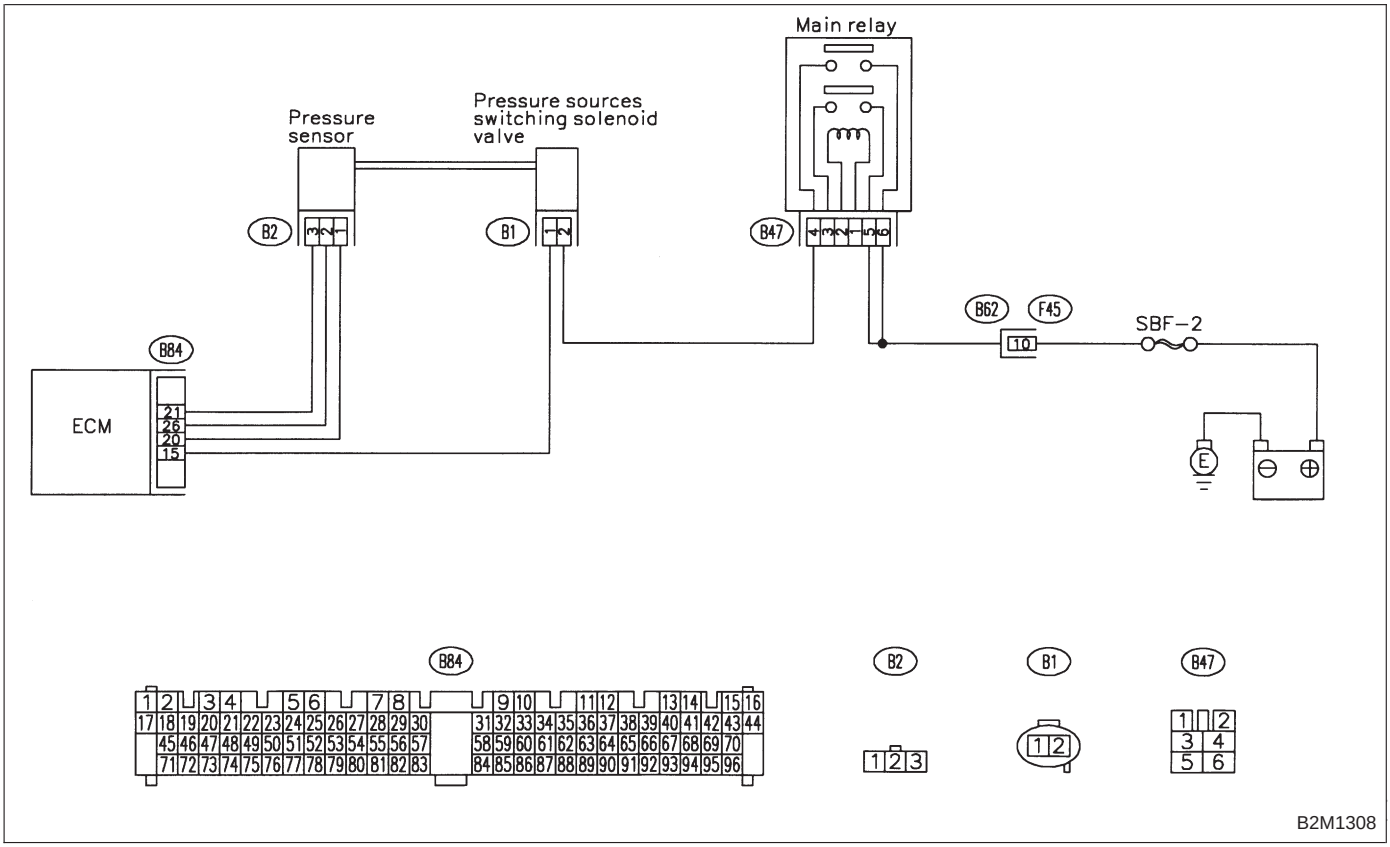
OBD (FB1)
P0106 <PS_R2>
B2M1062

E: DTC P0106 — PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

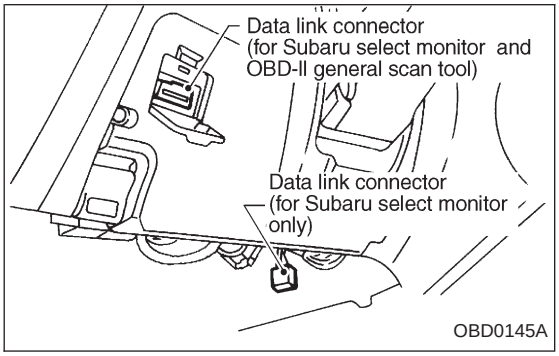
10E1	CHECK DTC P0107, P0108, P1102 OR P1122 ON DISPLAY.

CHECK : ***Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0107, P0108, P1102 OR P1122?***

YES : Inspect DTC P0107, P0108, P1102 OR P1122 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect DTC P0106.

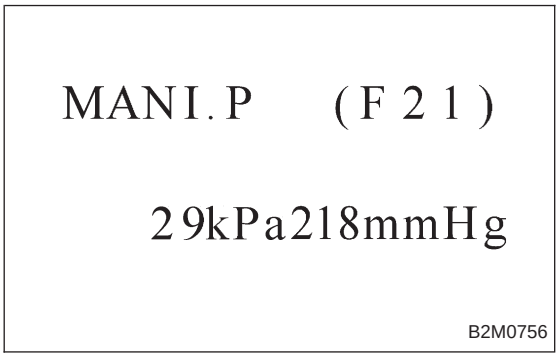
NO : Go to step **10E2**.



OBD0145A

10E2	CHECK DATA FOR CONTROL.

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch ON and Subaru Select Monitor or the OBD-II general scan tool switch ON.
4) Start engine.



B2M0756

5) Read data on Subaru Select Monitor or the OBD-II general scan tool.

- Subaru Select Monitor

Designate mode using function key.

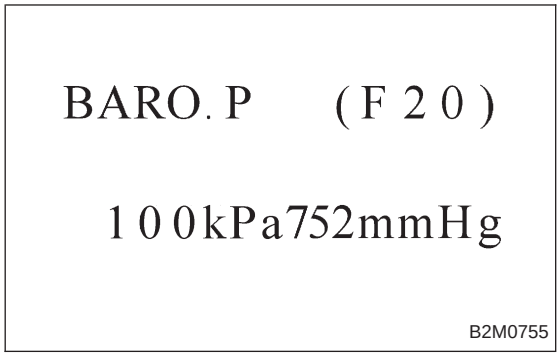
Function mode: F21 and F20

- F21: Display shows pressure signal value sent from the pressure sensor.
- F20: Display shows pressure signal value sent from the pressure sensor.

CHECK : ***Is the value more than 85 kPa in function mode F21?***

YES : Go to step **10E3**.

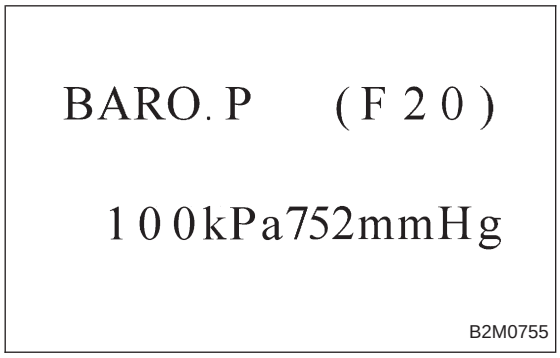
NO : Go to next CHECK .



CHECK : ***Is the value less than 32 kPa in function mode F20?***

YES : Go to step **10E4**.

NO : Go to next CHECK .



CHECK : ***Is the value more than 133 kPa in function mode F20?***

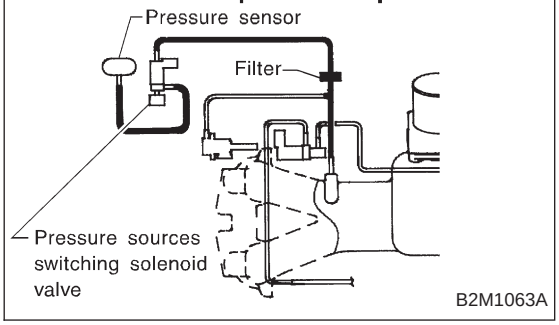
YES : Replace pressure sensor.

NO : Repair poor contact in pressure sensor connector, pressure sources switching solenoid valve connector, and ECM connector.

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

2200 cc AWD except Taiwan spec. vehicles



10E3	CHECK VACUUM HOSE.

CHECK : ***Is there a fault in vacuum hose?***

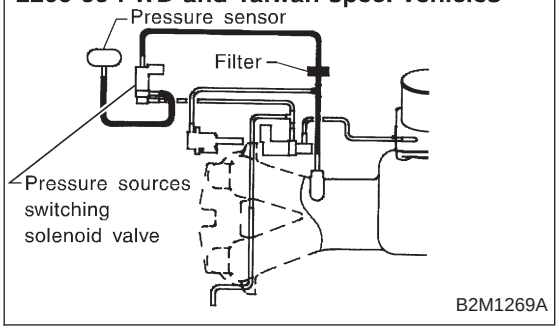
NOTE:
Check the following items.

- Disconnection of the vacuum hose from pressure sources switching solenoid valve to intake manifold
- Holes in the vacuum hose between pressure sources switching solenoid valve to intake manifold
- Clogging of the vacuum hose between pressure sources switching solenoid valve to intake manifold
- Disconnection of the vacuum hose from pressure sensor to pressure sources switching solenoid valve
- Holes in the vacuum hose between pressure sensor and pressure sources switching solenoid valve
- Clogging of the vacuum hose between pressure sensor and pressure sources switching solenoid valve
- Clogging of the filter

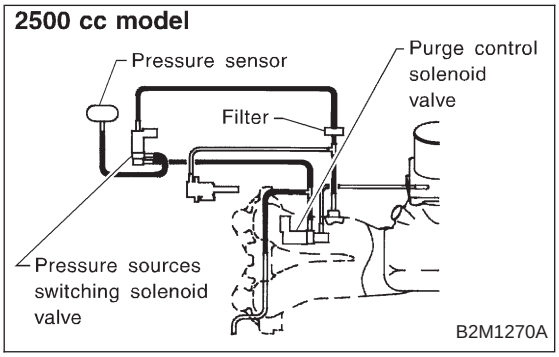
YES : Repair or replace hoses or filter.

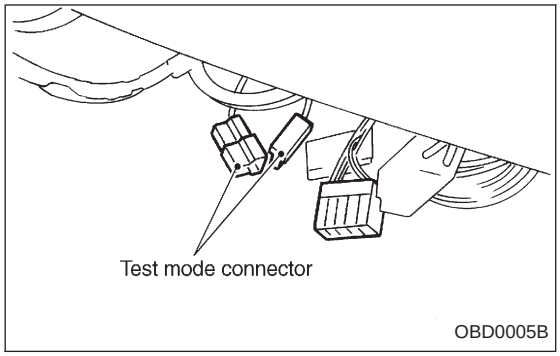
NO : Go to step **10E4**.

2200 cc FWD and Taiwan spec. vehicles



2500 cc model





10E4	**CHECK PRESSURE SOURCES SWITCHING SOLENOID VALVE.**

1) Turn ignition switch to OFF.
2) Connect test mode connector.
3) Turn ignition switch to ON.

CHECK ***: Does pressure sources switching solenoid valve produce operating sound? (ON ↔ OFF each 1.5 sec.)***

NOTE:
Pressure sources switching solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD10). For the procedure, refer to “COMPULSORY VALVE OPERATION CHECK MODE”. <Ref. to 2-7 [T3F0].>

YES : Replace pressure sensor.

NO : Replace pressure sources switching solenoid valve.

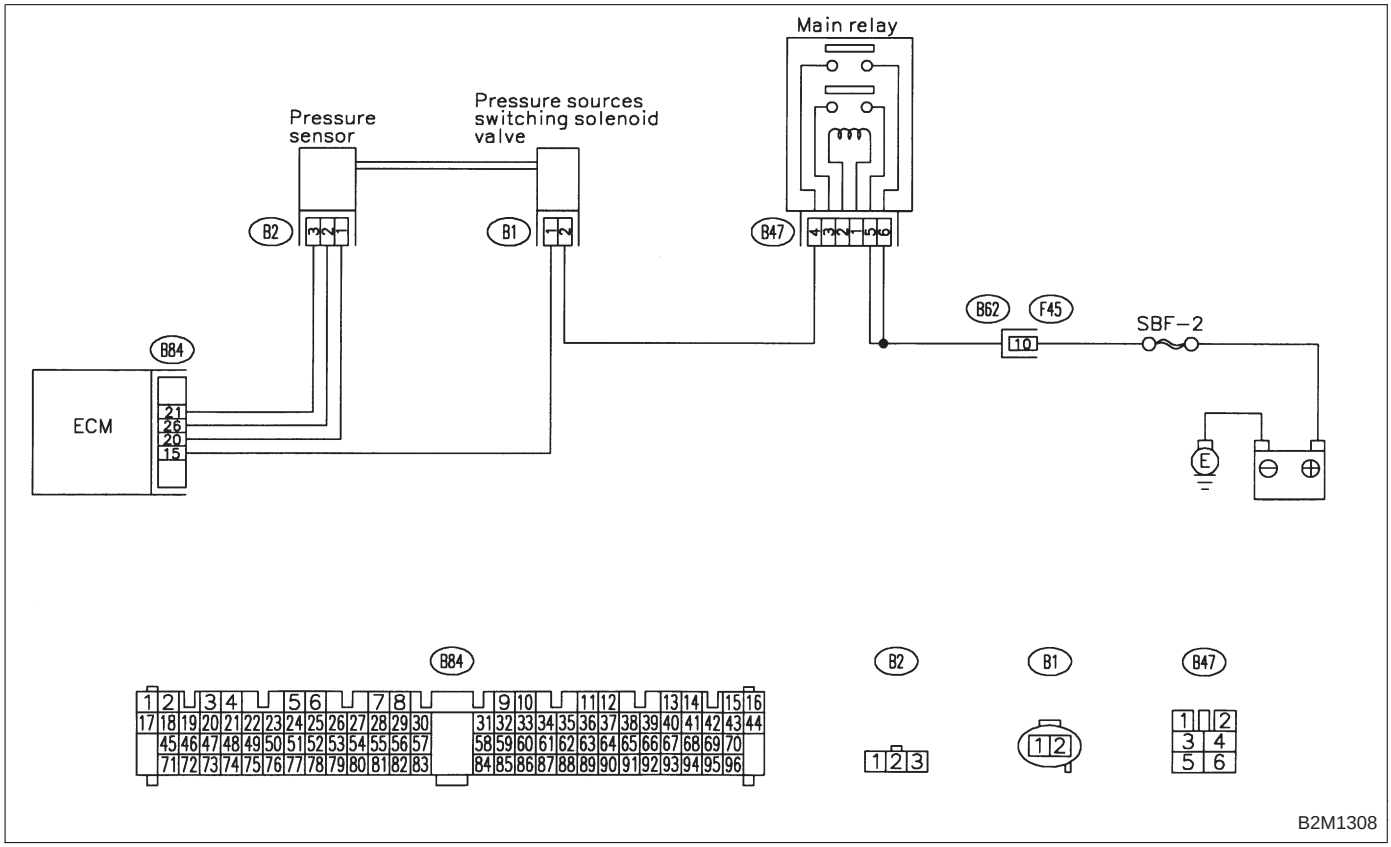
OBD (FB1)
P0107 <P_SLOW>
B2M1064

F: DTC P0107 — PRESSURE SENSOR CIRCUIT LOW INPUT —

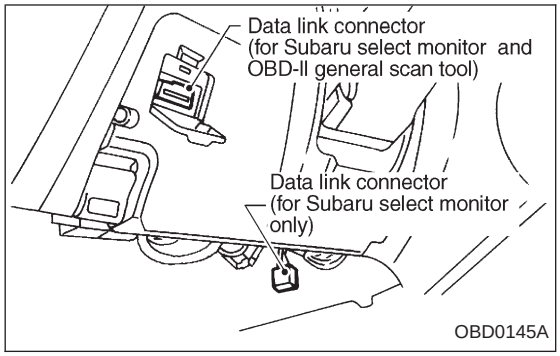
DTC DETECTING CONDITION:

- Immediately at fault recognition

WIRING DIAGRAM:

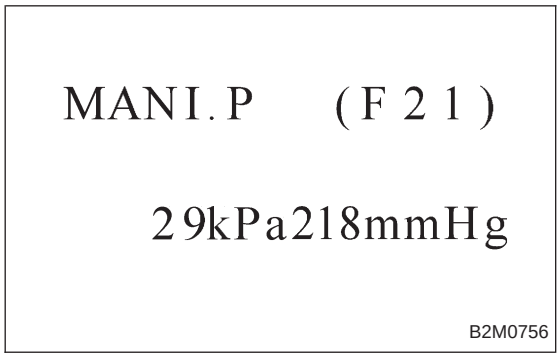


CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10F1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
4) Start engine.



5) Read the data on Subaru Select Monitor or the OBD-II general scan tool.
● Subaru Select Monitor
Designate mode using function key.

Function mode: F21

● F21: Display shows pressure signal value sent from pressure sensor.

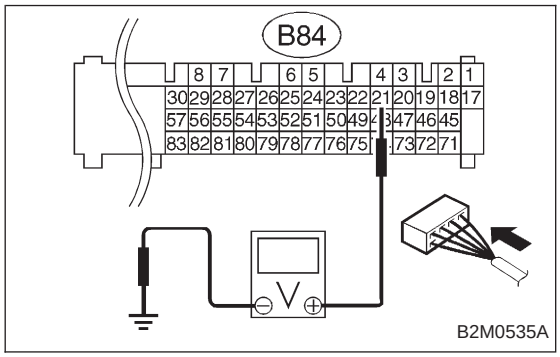
CHECK ***: Is the value less than 0 kPa in function mode F21?***

YES : Go to step **10F2**.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time.

● OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



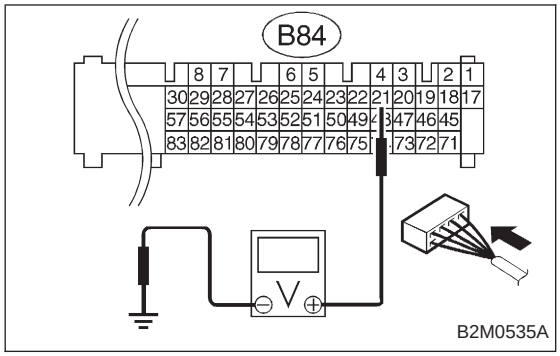
10F2	CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

1) Measure voltage between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 21 (+) — Chassis ground (−): Is the voltage more than 4.5 V?***

YES : Go to next step 2).

NO : Go to next CHECK .

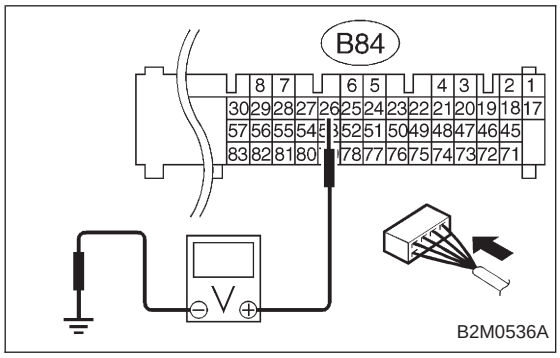


CHECK : ***Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?***

YES : Repair poor contact in ECM connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

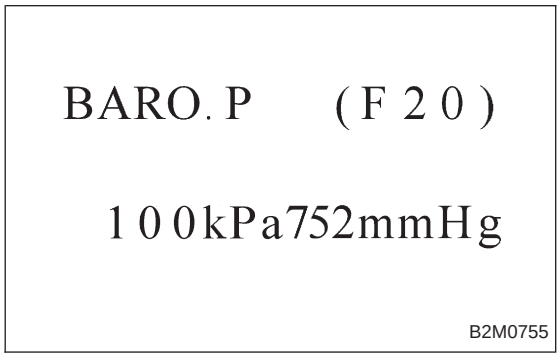


2) Measure voltage between ECM and chassis ground.

CHECK : ***Connector & terminal (B84) No. 26 (+) — Chassis ground (−): Is the voltage less than 0.2 V?***

YES : Go to step **10F3**.

NO : Go to next step 3).



3) Read data on Subaru Select Monitor.
● Subaru Select Monitor
Designate mode using function key.

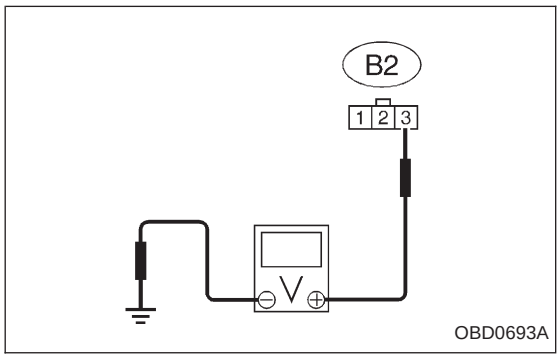
Function mode: F20

● F20: Display shows pressure signal value sent from pressure sensor.

CHECK : ***Does the value change more than 0 kPa by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?***

YES : Repair poor contact in ECM connector.

NO : Go to step **10F3**.



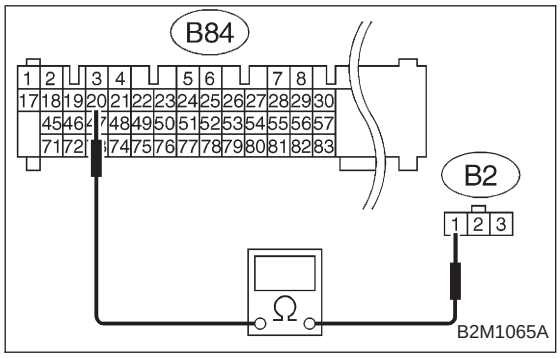
10F3	CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from pressure sensor.
3) Turn ignition switch to ON.
4) Measure voltage between pressure sensor connector and engine ground.

CHECK ***: Connector & terminal (B2) No. 3 (+) — Engine ground (−): Is the voltage more than 4.5 V?***

YES : Go to next step 5).

NO : Repair open circuit in harness between ECM and pressure sensor connector.

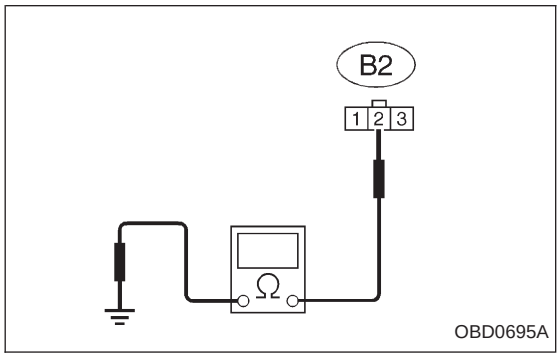


5) Turn ignition switch to OFF.
6) Disconnect connector from ECM.
7) Measure resistance of harness between ECM and pressure sensor connector.

CHECK ***: Connector & terminal (B84) No. 20 — (B2) No. 1: Is the resistance less than 1 Ω?***

YES : Go to next step 8).

NO : Repair open circuit in harness between ECM and pressure sensor connector.



8) Measure resistance of harness between pressure sensor connector and engine ground.

CHECK ***: Connector & terminal (B2) No. 2 — Engine ground: Is the resistance more than 500 kΩ?***

YES : Go to next CHECK .

NO : Repair ground short circuit in harness between ECM and pressure sensor connector.

CHECK ***: Is there poor contact in pressure sensor connector?***

YES : Repair poor contact in pressure sensor connector.

NO : Replace pressure sensor.

OBD (FB1)
P0108 <P_SHI>

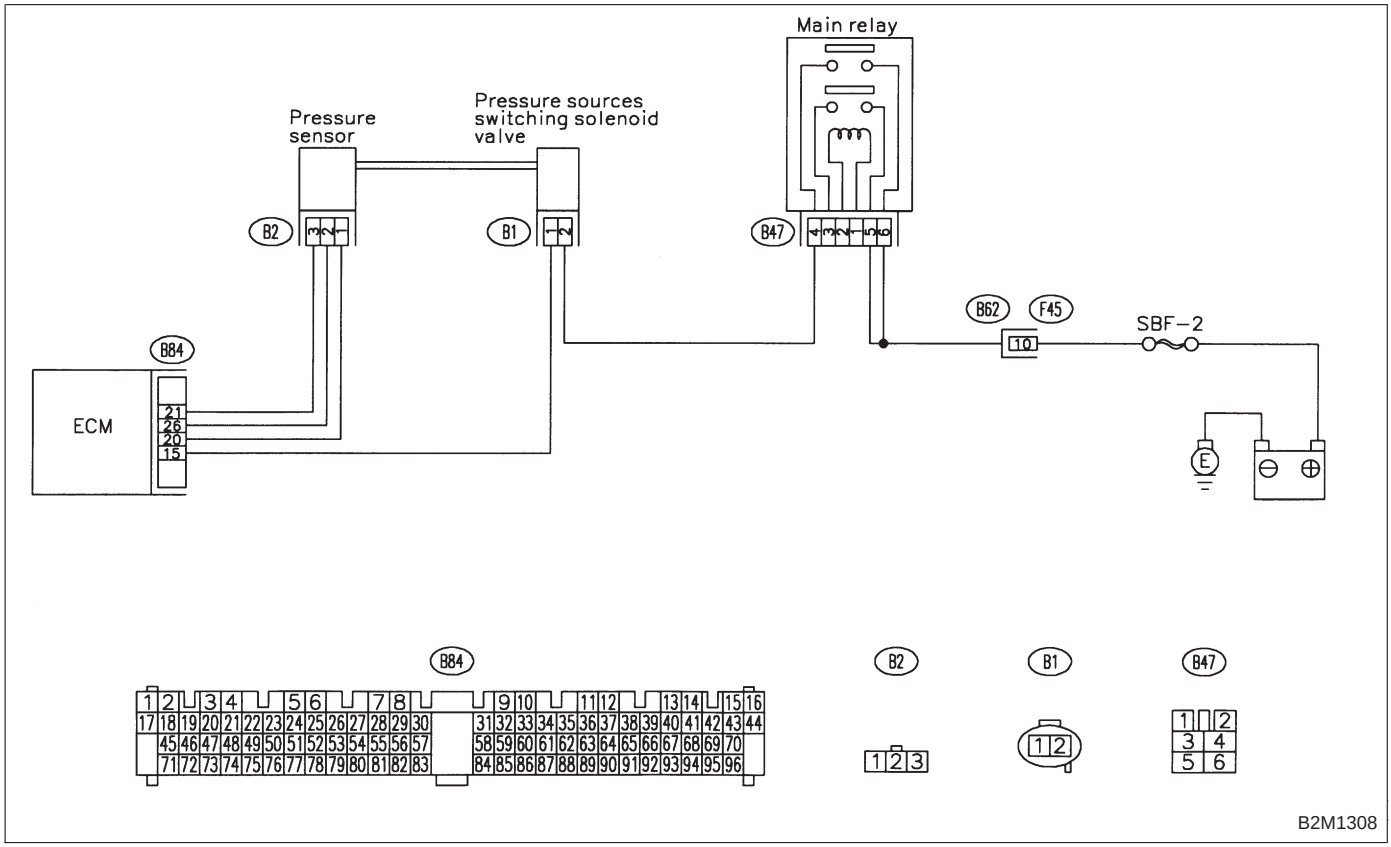
B2M1066

G: DTC P0108 — PRESSURE SENSOR CIRCUIT HIGH INPUT —

DTC DETECTING CONDITION:

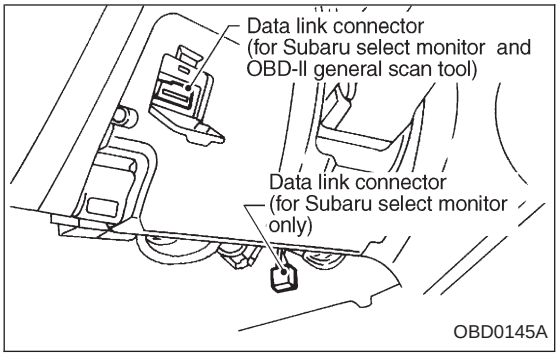
- Immediately at fault recognition

WIRING DIAGRAM:



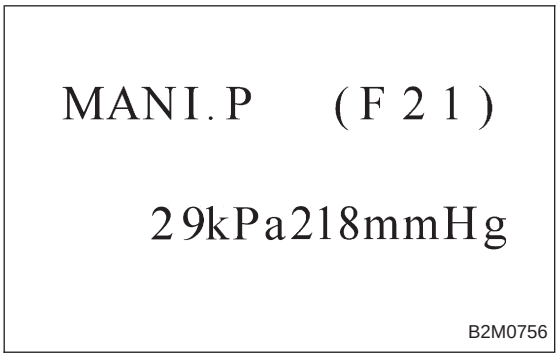
B2M1308

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10G1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
4) Start engine.



5) Read the data on Subaru Select Monitor or the OBD-II general scan tool.
● Subaru Select Monitor
Designate mode using function key.

Function mode: F21

● F21: Display shows pressure signal value sent from pressure sensor.

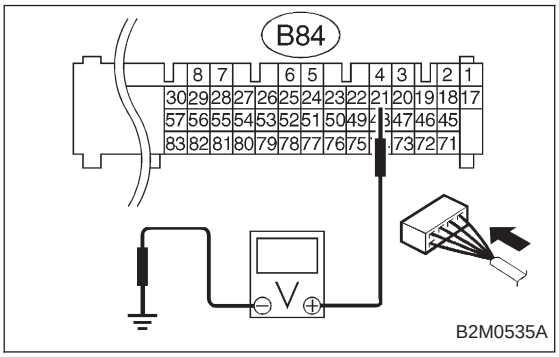
CHECK ***: Is the value more than 140 kPa in function mode F21?***

YES : Go to step **10G4**.

NO : Go to step **10G2**.

● OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



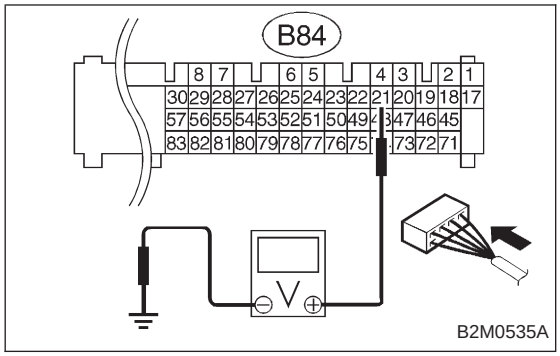
10G2	CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

1) Measure voltage between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 21 (+) — Chassis ground (−): Is the voltage more than 4.5 V?***

YES : Go to next step 2).

NO : Go to next CHECK .

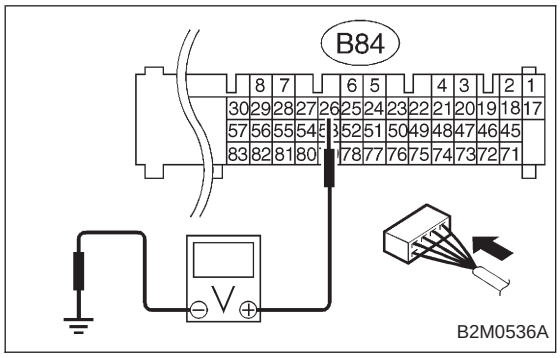


CHECK : ***Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?***

YES : Repair poor contact in ECM connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

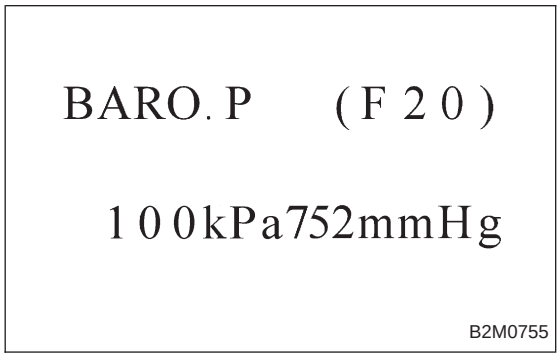


2) Measure voltage between ECM and chassis ground.

CHECK : ***Connector & terminal (B84) No. 26 (+) — Chassis ground (−): Is the voltage less than 0.2 V?***

YES : Go to step **10G3**.

NO : Go to next step 3).



3) Read data on Subaru Select Monitor.

● Subaru Select Monitor

Designate mode using function key.

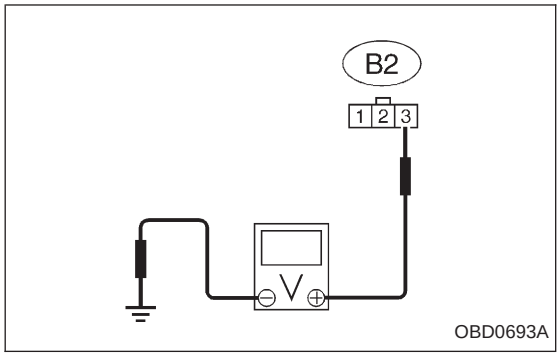
Function mode: F20

● F20: Display shows pressure signal value sent from pressure sensor.

CHECK : ***Does the value change more than 0 kPa by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?***

YES : Repair poor contact in ECM connector.

NO : Go to step **10G3**.



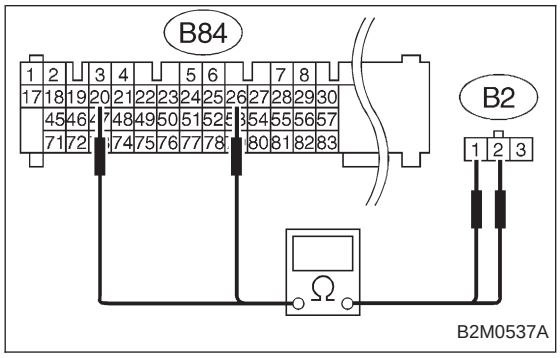
10G3	CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from pressure sensor.
3) Turn ignition switch to ON.
4) Measure voltage between pressure sensor connector and engine ground.

CHECK ***: Connector & terminal (B2) No. 3 (+) — Engine ground (−): Is the voltage more than 4.5 V?***

YES : Go to next step 5).

NO : Repair open circuit in harness between ECM and pressure sensor connector.



5) Turn ignition switch to OFF.
6) Disconnect connector from ECM.
7) Measure resistance of harness between ECM and pressure sensor connector.

CHECK ***: Connector & terminal (B84) No. 26 — (B2) No. 2: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM and pressure sensor connector.

CHECK ***: Connector & terminal (B84) No. 20 — (B2) No. 1: Is the resistance less than 1 Ω?***

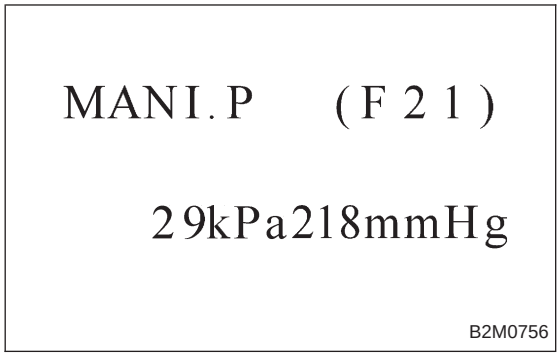
YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM and pressure sensor connector.

CHECK ***: Is there poor contact in pressure sensor connector?***

YES : Repair poor contact in pressure sensor connector.

NO : Replace pressure sensor.



10G4	CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR.

1) Turn ignition switch to OFF and Subaru Select Monitor or the OBD-II general scan tool switch to OFF.
2) Disconnect connector from pressure sensor.
3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
4) Read data on Subaru select monitor or the OBD-II general scan tool.

● Subaru Select Monitor

Designate mode using function key.

Function mode: F21

CHECK ***: Is the value more than 140 kPa in function mode F21?***

YES : Repair battery short circuit in harness between ECM and pressure sensor connector.

NO : Replace pressure sensor.

● OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

OBD (FB1)
P0116 <TW_LOW>
B2M1067

H: DTC P0116 — ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT LOW INPUT —

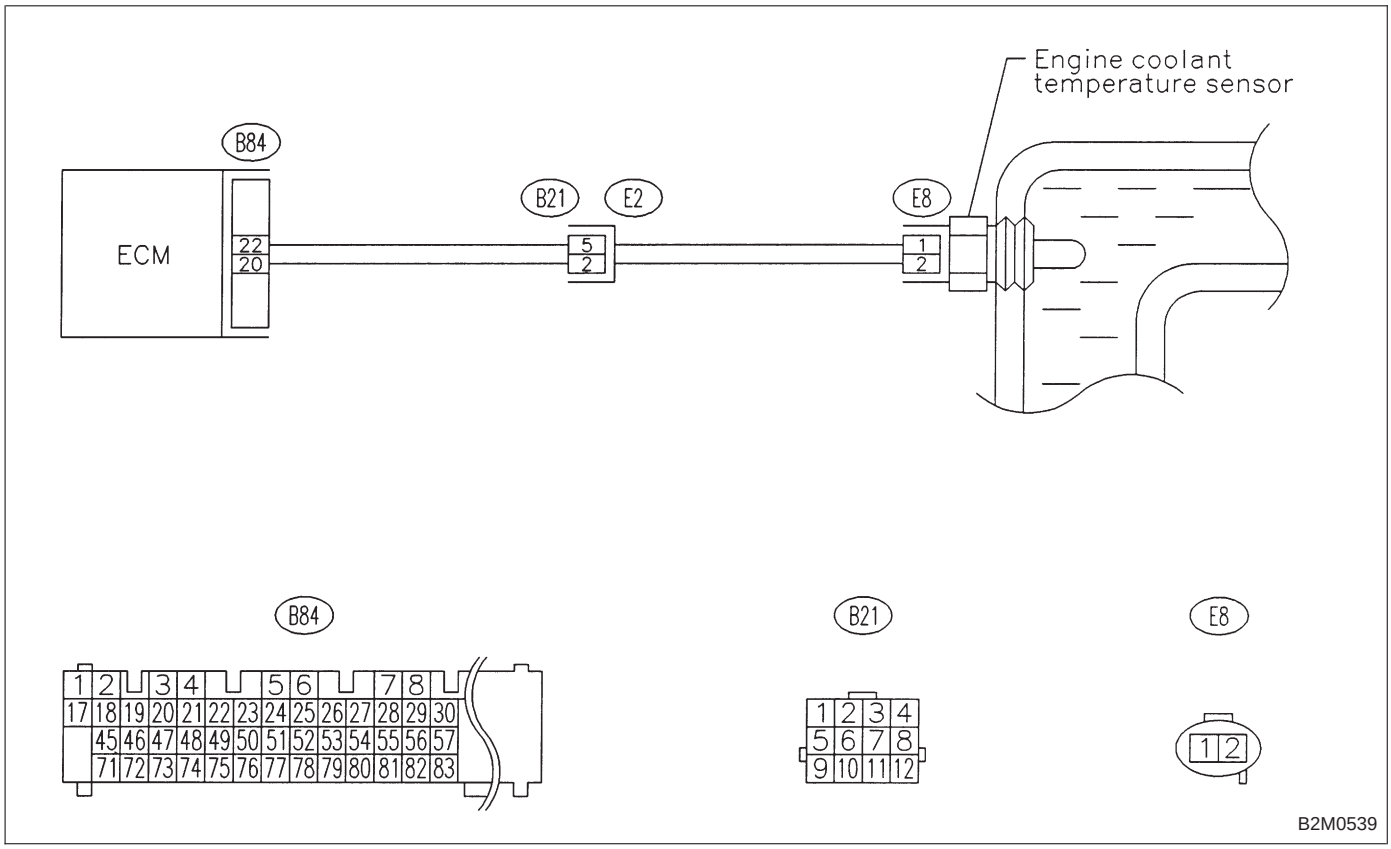
DTC DETECTING CONDITION:

- Immediately at fault recognition

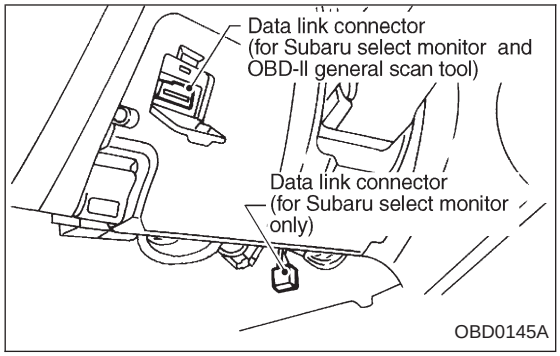
TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

WIRING DIAGRAM:

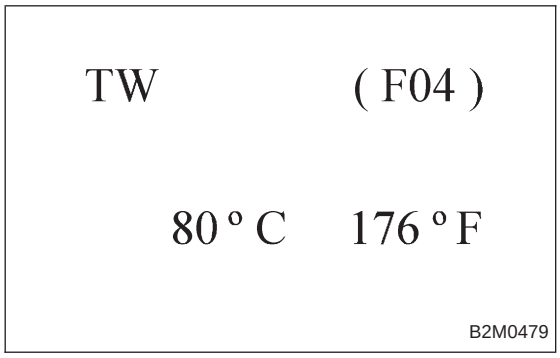


CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10H1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
4) Start engine.



5) Read data on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor

Designate mode using function key.

Function mode: F04

- F04: Water temperature is indicated in "°C" and "°F".

CHECK ***: Is the value greater than 150°C or 300°F in function mode F04?***

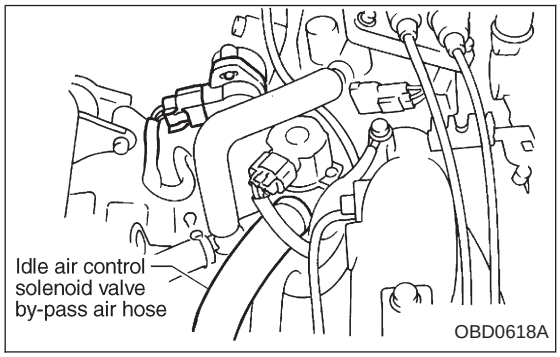
YES : Go to step **10H2**.

NO : Repair poor contact.

NOTE:
In this case, repair the following:

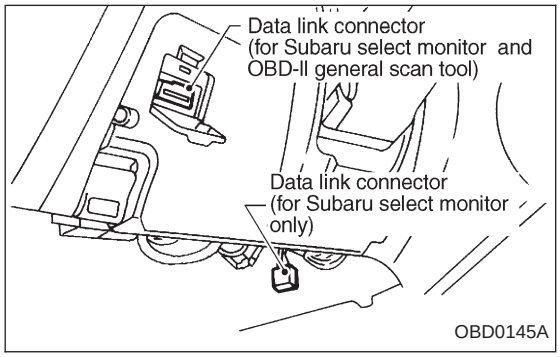
- Poor contact in engine coolant temperature sensor
- Poor contact in ECM
- Poor contact in coupling connector (B21)
- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

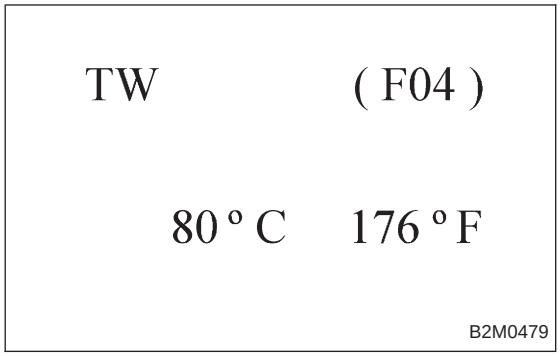


10H2	CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Remove idle air control solenoid valve by-pass air hose.
3) Disconnect connector from engine coolant temperature sensor.



4) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
5) Turn ignition switch and Subaru Select Monitor or OBD-II general scan tool switch to ON.



6) Read data on Subaru Select Monitor or the OBD-II general scan tool.

● Subaru Select Monitor

Designate mode using function key.

Function mode: F04

● F04: Water temperature is indicated in "°C" and "°F".

CHECK ***: Is the value less than −40°C or −40°F in function mode F04?***

YES : Replace engine coolant temperature sensor.

NO : Repair ground short circuit in harness between engine coolant temperature sensor and ECM connector.

● OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

OBD (FB1)
P0117 <TW_HI>
B2M1068

I: DTC P0117 — ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT HIGH INPUT —

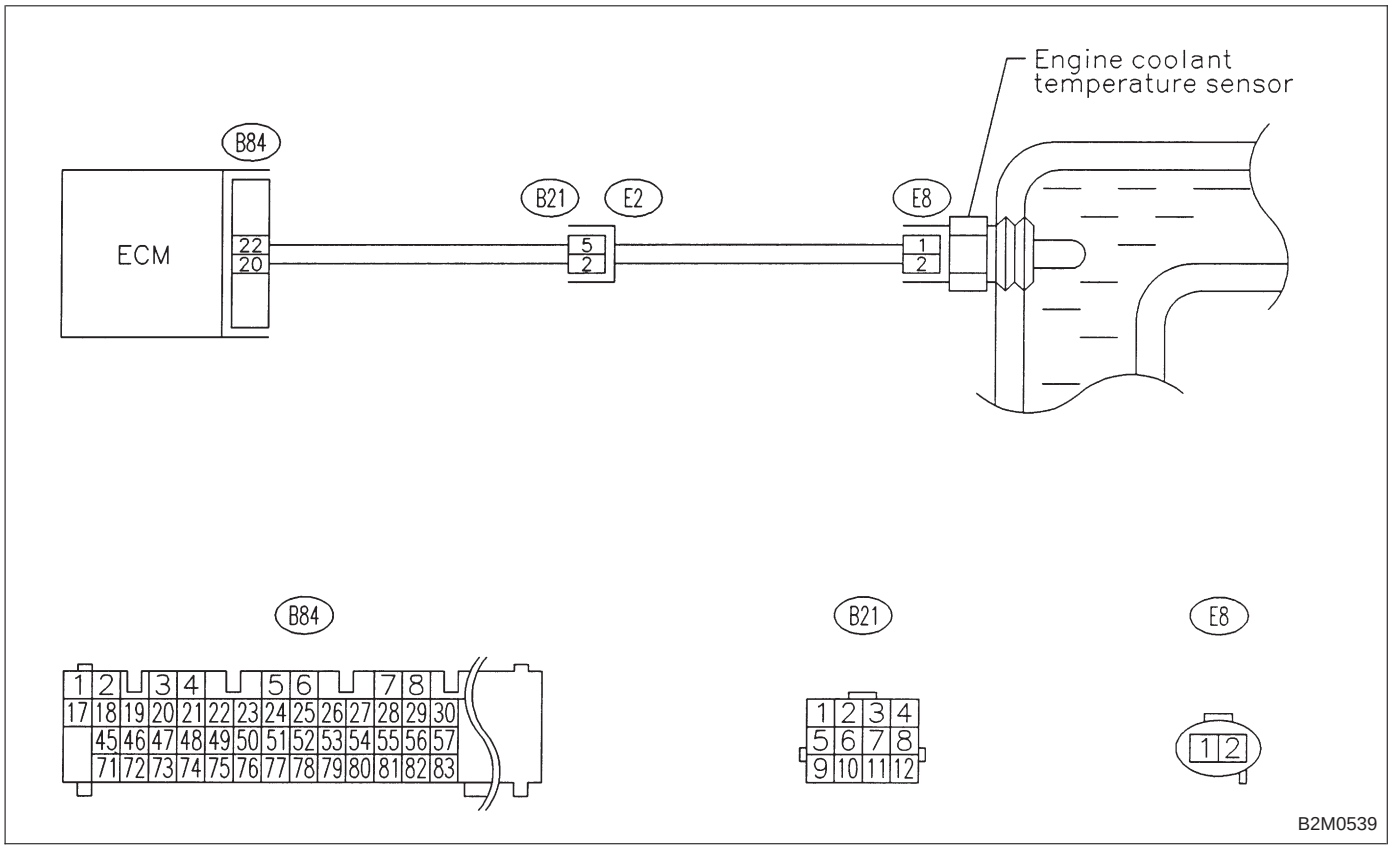
DTC DETECTING CONDITION:

- Immediately at fault recognition

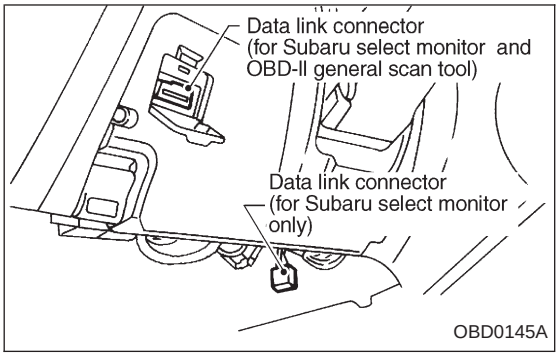
TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

WIRING DIAGRAM:

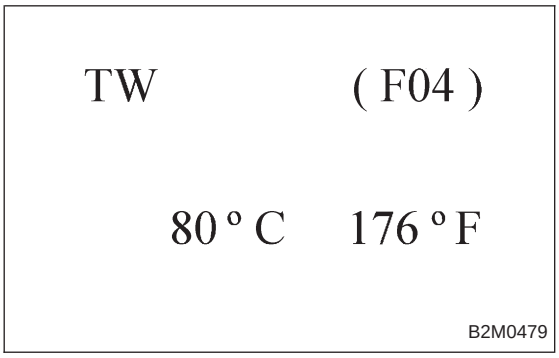


CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10I1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
4) Start engine.



5) Read data on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor

Designate mode using function key.

Function mode: F04

- F04: Water temperature is indicated in "°C" and "°F".

CHECK ***: Is the value less than −40°C or −40°F in function mode F04?***

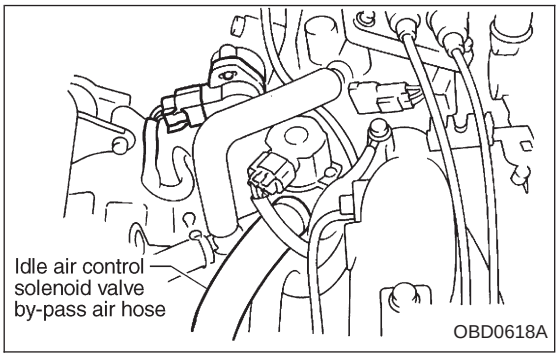
YES : Go to step **10I3**.

NO : Repair poor contact.

NOTE:
In this case, repair the following:

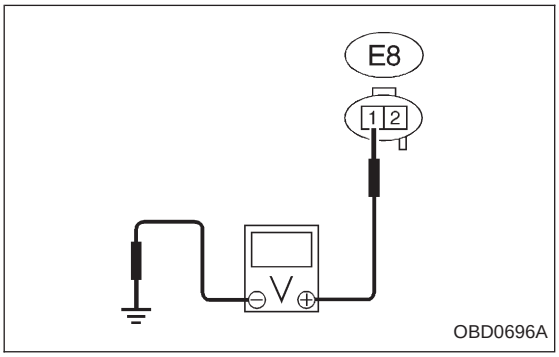
- Poor contact in engine coolant temperature sensor
- Poor contact in ECM
- Poor contact in coupling connector (B21)
- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



10I2	CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Remove idle air control solenoid valve by-pass air hose.
3) Disconnect connector from engine coolant temperature sensor.

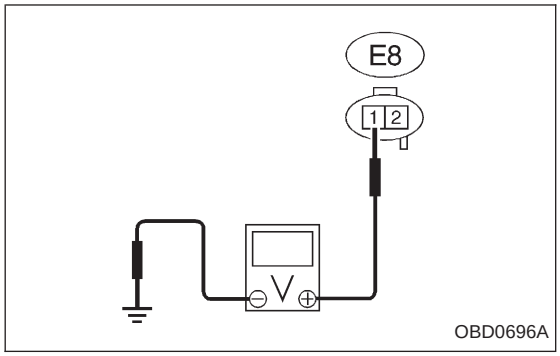


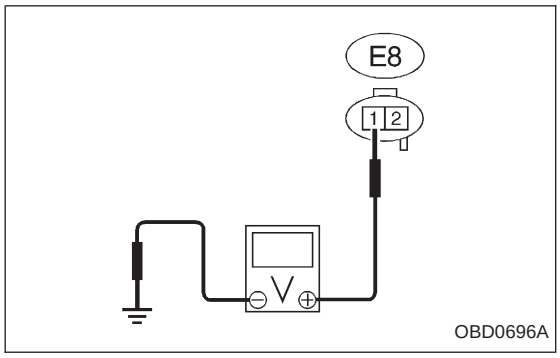
4) Measure voltage between engine coolant temperature sensor connector and engine ground.

CHECK ***: Connector & terminal (E8) No. 1 (+) — Engine ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and engine coolant temperature sensor connector.

NO : Go to next step 5).





5) Turn ignition switch to ON.
6) Measure voltage between engine coolant temperature sensor connector and engine ground.

CHECK : ***Connector & terminal (E8) No. 1 (+) — Engine ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and engine coolant temperature sensor connector.

NO : Go to step **10I3**.

10I3	**CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.**

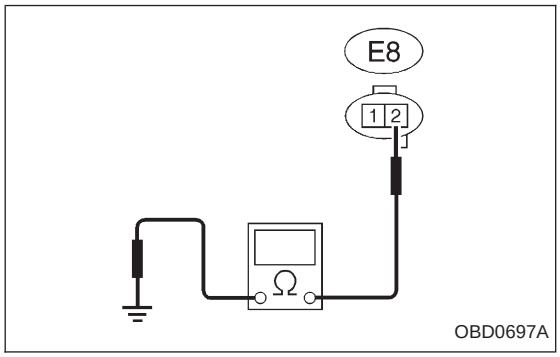
1) Measure voltage between engine coolant temperature sensor connector and engine ground.

CHECK : ***Connector & terminal (E8) No. 1 (+) — Engine ground (−): Is the voltage more than 4 V?***

YES : Go to next step 2).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and engine coolant temperature sensor connector
- Poor contact in engine coolant temperature sensor connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B21)



2) Turn ignition switch to OFF.
3) Measure resistance of harness between engine coolant temperature sensor connector and engine ground.

CHECK : ***Connector & terminal (E8) No. 2 — Engine ground: Is the resistance less than 5 Ω?***

YES : Replace engine coolant temperature sensor.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and engine coolant temperature sensor connector
- Poor contact in engine coolant temperature sensor connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B21)

OBD (FB1)

P0121 <TH_RHI>

B2M1069

J: DTC P0121 — THROTTLE POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) —

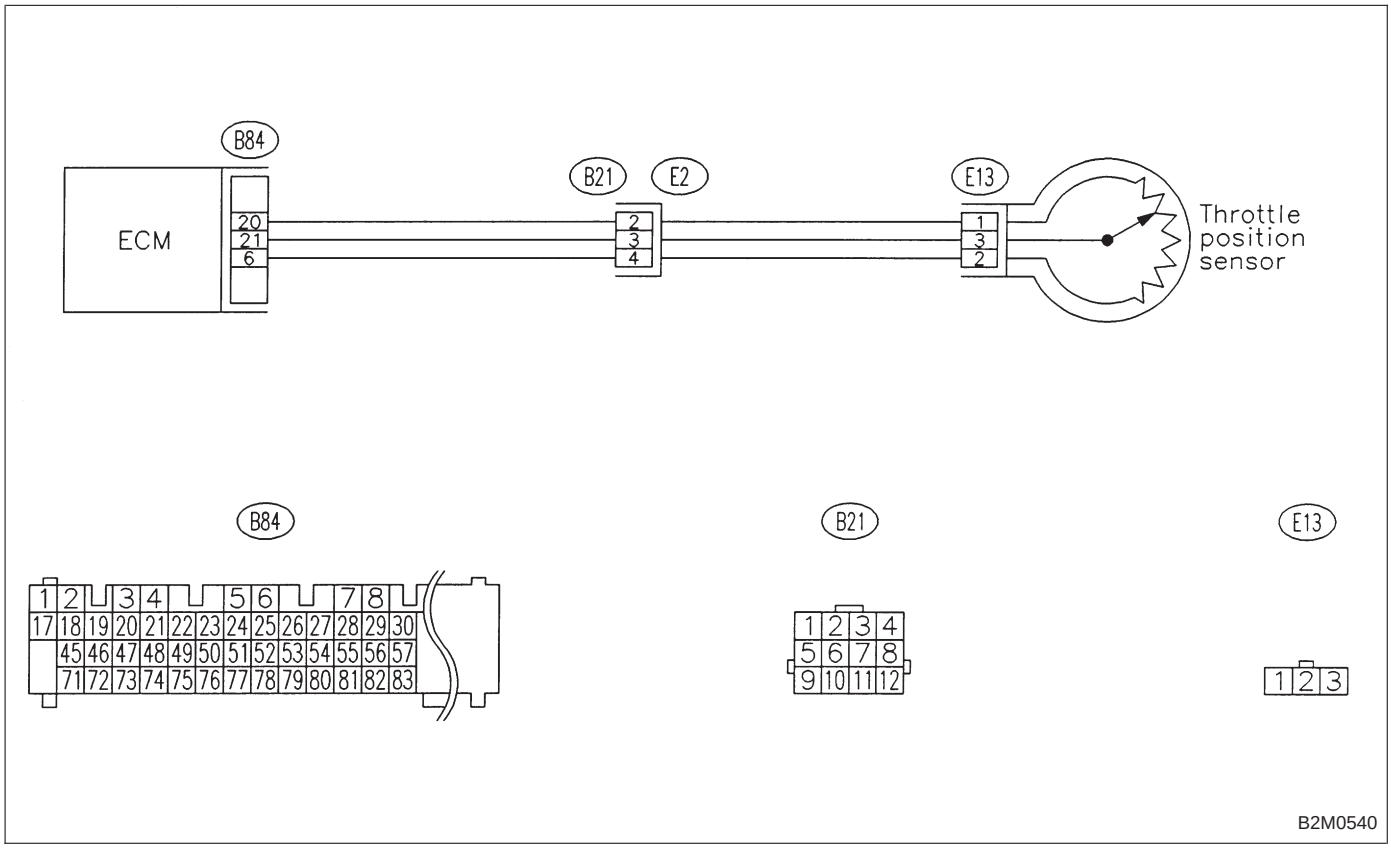
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

WIRING DIAGRAM:



B2M0540

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10J1	**CHECK DTC P0122 OR P0123 ON DISPLAY.**

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0122 or P0123?***

YES : Inspect DTC P0122 or P0123 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect DTC P0121.

NO : Replace throttle position sensor.

OBD (FB1)
P0122 <THV_LOW>
B2M1070

K: DTC P0122 — THROTTLE POSITION SENSOR CIRCUIT LOW INPUT —

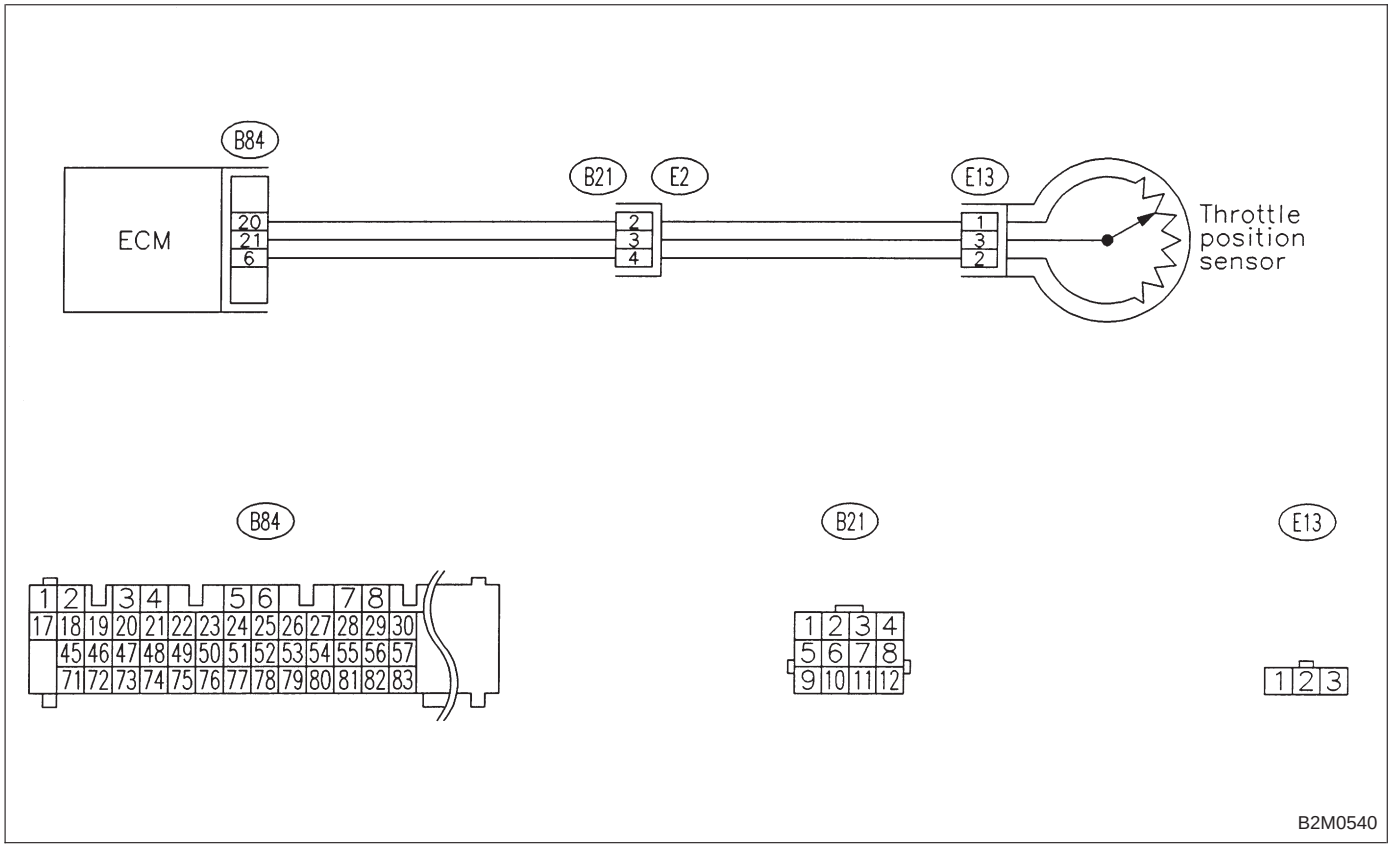
DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

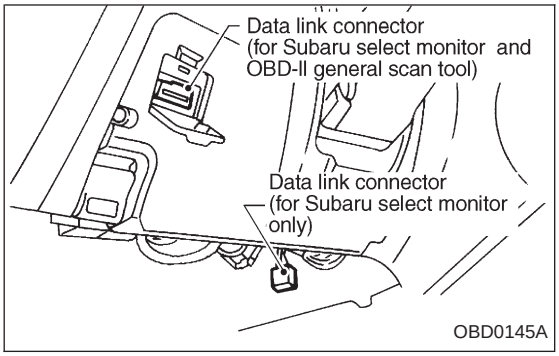
- Erroneous idling
- Engine stalls.
- Poor driving performance

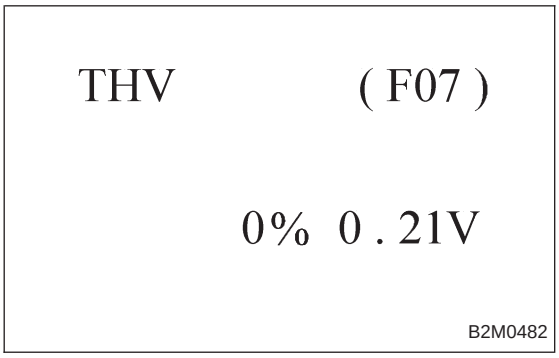
WIRING DIAGRAM:



B2M0540

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>





10K1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
4) Start engine.

5) Read data on Subaru Select Monitor or OBD-II general scan tool.
- Subaru Select Monitor

Designate mode using function key.

Function mode: F07

- F07: Throttle position sensor output signal is indicated.

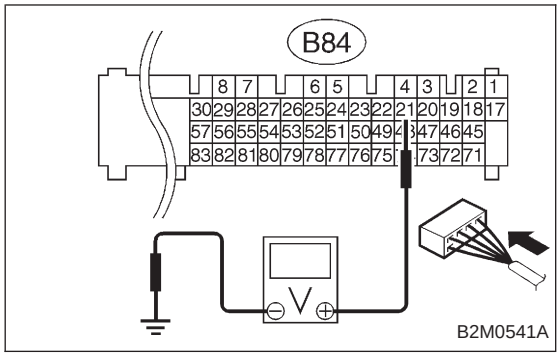
CHECK ***: Is the value less than 0.1 V in function mode F07?***

YES : Go to step **10G2**.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.

NOTE:
In this case, repair the following:
- Poor contact in throttle position sensor connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B21)
- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



10K2	CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

1) Measure voltage between ECM connector and chassis ground while throttle valve is fully closed.

CHECK ***: Connector & terminal (B84) No. 21 (+) — Chassis ground (−): Is the voltage more than 4.5 V?***

YES : Go to next step 2).

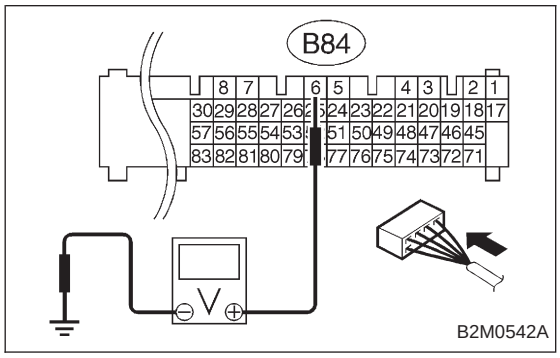
NO : Go to next CHECK .

CHECK ***: Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?***

YES : Repair poor contact in ECM connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

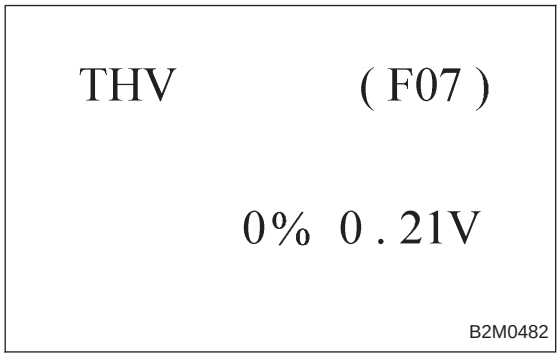


2) Measure voltage between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 6 (+) — Chassis ground (−): Is the voltage less than 0.1 V?***

YES : Go to step **10K3**.

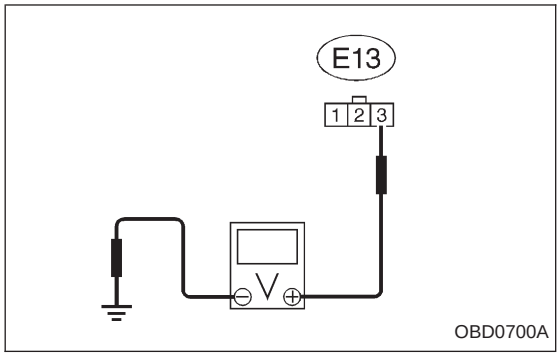
NO : Go to next CHECK .



CHECK ***: Does the voltage change more than 0.1 V by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?***

YES : Repair poor contact in ECM connector.

NO : Go to step **10K3**.



10K3	CHECK HARNESS BETWEEN ECM AND THROTTLE POSITION SENSOR CONNECTOR.

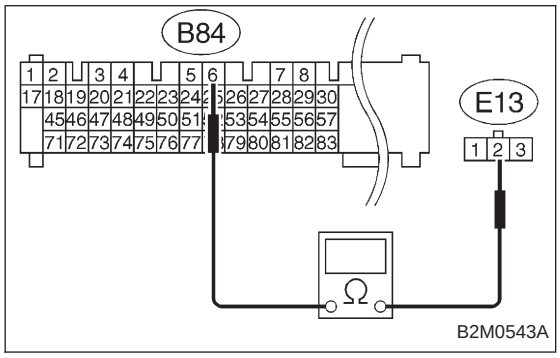
1) Turn ignition switch to OFF.
2) Disconnect connectors from throttle position sensor.
3) Turn ignition switch to ON.
4) Measure voltage between throttle position sensor connector and engine ground.

CHECK ***: Connector & terminal (E13) No. 3 (+) — Engine ground (−): Is the voltage more than 4.5 V?***

YES : Go to next step 5).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between throttle position sensor and ECM connector
- Poor contact in throttle position sensor connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B21)



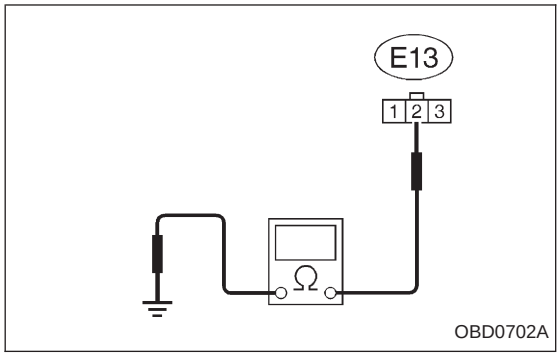
5) Turn ignition switch to OFF.
6) Measure resistance of harness between ECM connector and throttle position sensor connector.

CHECK ***: Connector & terminal (B84) No. 6 — (E13) No. 2: Is the resistance less than 1 Ω?***

YES : Go to next step 7).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between throttle position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in throttle position sensor connector
- Poor contact in coupling connector (B21)



7) Measure resistance of harness between throttle position sensor connector and engine ground.

CHECK ***: Connector & terminal (E13) No. 2 — Engine ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between throttle position sensor and ECM connector.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in throttle position sensor connector?***

YES : Repair poor contact in throttle position sensor connector.

NO : Replace throttle position sensor.

OBD (FB1)
P0123 <THV_HI>
B2M1071

L: DTC P0123 — THROTTLE POSITION SENSOR CIRCUIT HIGH INPUT —

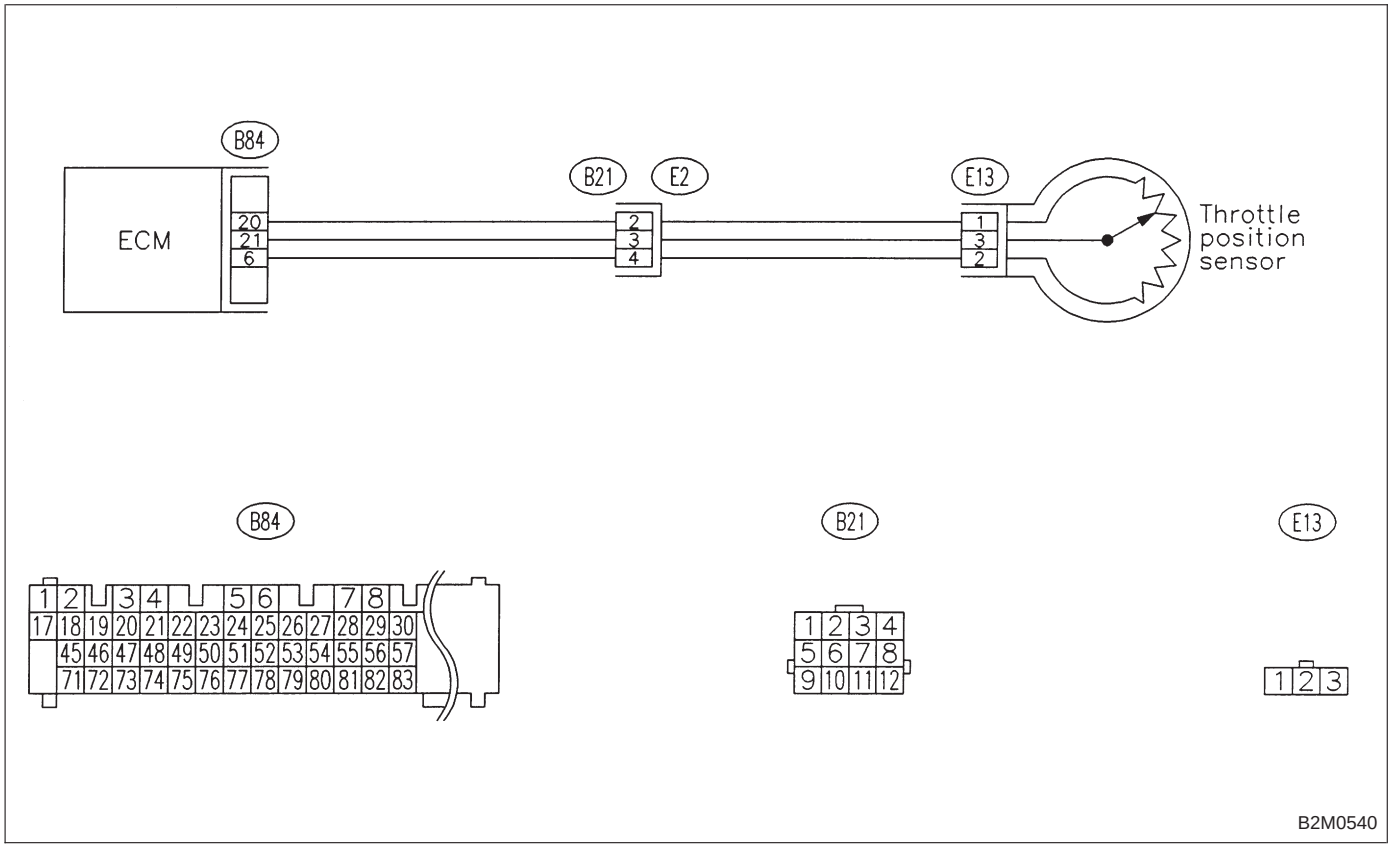
DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

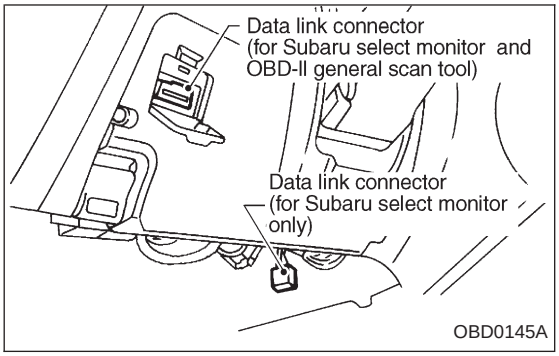
- Erroneous idling
- Engine stalls.
- Poor driving performance

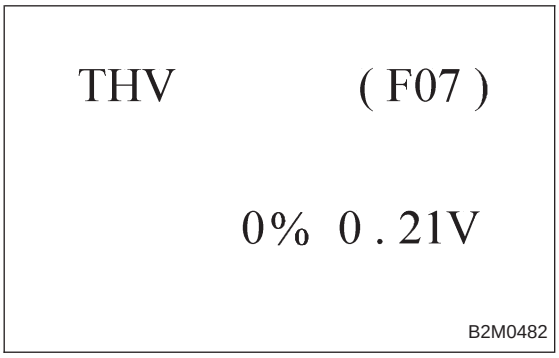
WIRING DIAGRAM:



B2M0540

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>





10L1	**CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.**

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
4) Start engine.

5) Read data on Subaru Select Monitor or OBD-II general scan tool.
- Subaru Select Monitor

Designate mode using function key.

Function mode: F07

- F07: Throttle position sensor output signal is indicated.

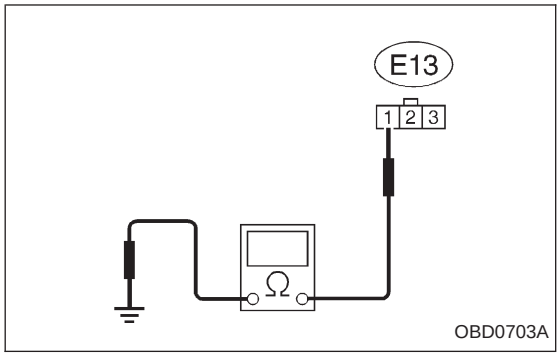
CHECK ***: Is the value more than 4.9 V in function mode F07?***

YES : Go to step **10L2**.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.

NOTE:
In this case, repair the following:
- Poor contact in throttle position sensor connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B21)
- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



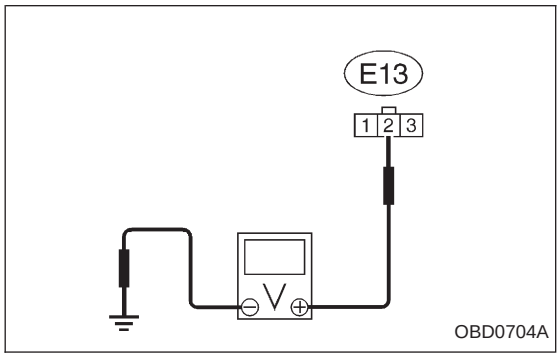
10L2	**CHECK HARNESS BETWEEN THROTTLE POSITION SENSOR AND BODY CONNECTOR.**

1) Turn ignition switch to OFF.
2) Disconnect connector from throttle position sensor.
3) Measure resistance of harness between throttle position sensor connector and engine ground.

CHECK ***: Connector & terminal (E13) No. 1 — Engine ground: Is the resistance less than 5 Ω?***

YES : Go to next step 4).

NO : Repair open circuit in harness between throttle position sensor and ECM connector.



4) Turn ignition switch to ON.
5) Measure voltage between throttle position sensor connector and engine ground.

CHECK ***: Connector & terminal (E13) No. 2 (+) — Engine ground (−): Is the voltage more than 4.9 V?***

YES : Repair battery short circuit in harness between throttle position sensor and ECM connector. After repair, replace ECM.

NO : Replace throttle position sensor.

OBD (FB1)

P0125 <TW_CL>

OBD0191

M: DTC P0125 — INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL —

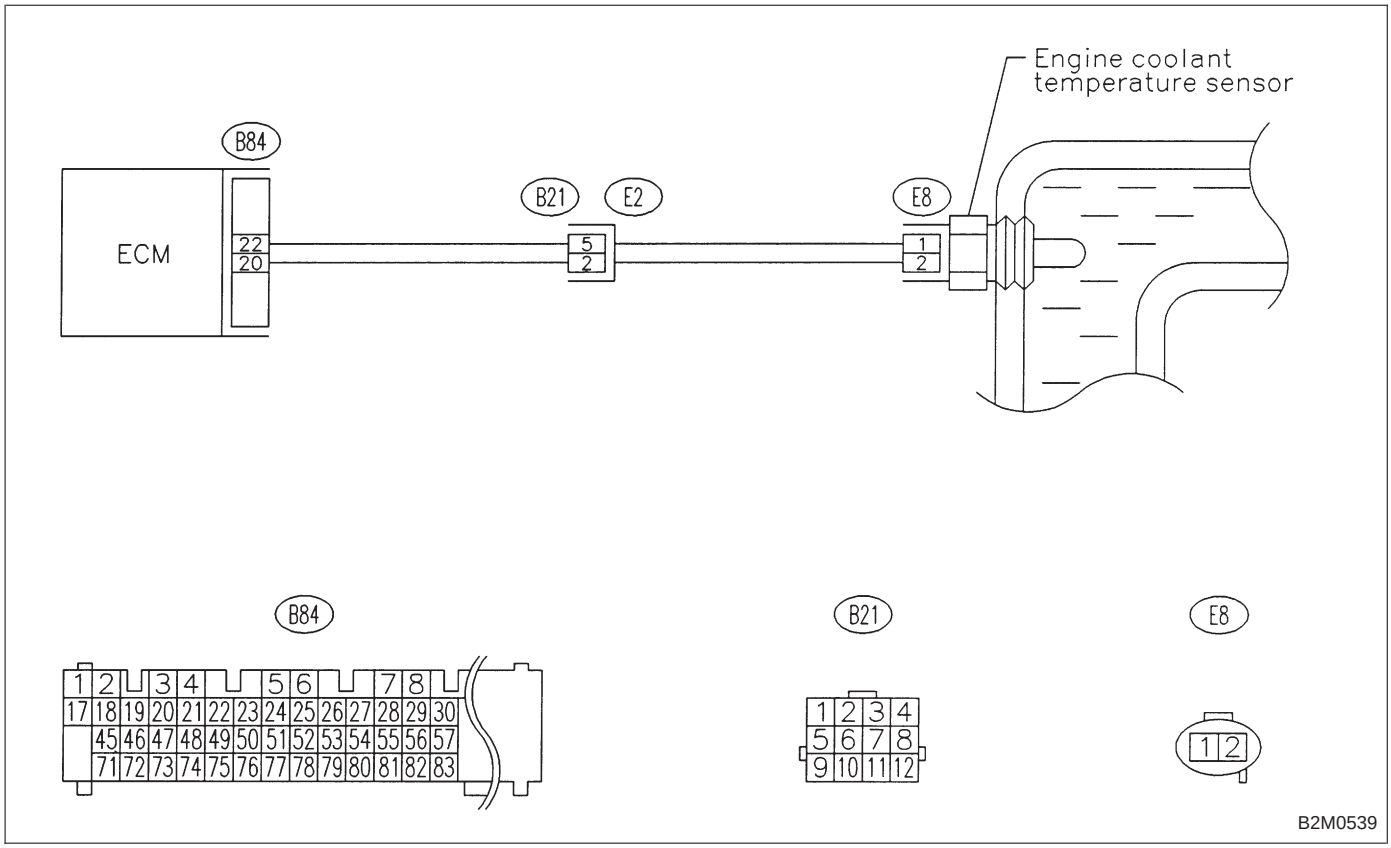
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Engine would not return to idling.

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

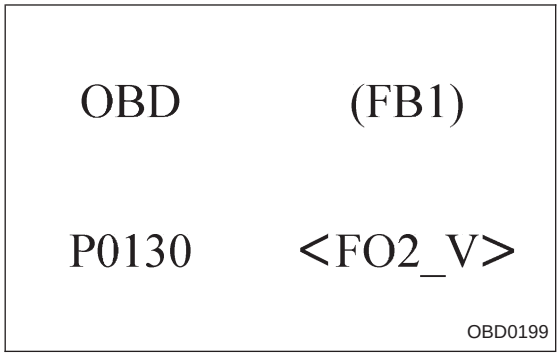
10M1	**CHECK DTC P0116 OR P0117 ON DISPLAY.**

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0116 or P0117?***

YES : Inspect DTC P0116 or P0117 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect DTC P0125.

NO : Replace engine coolant temperature sensor.

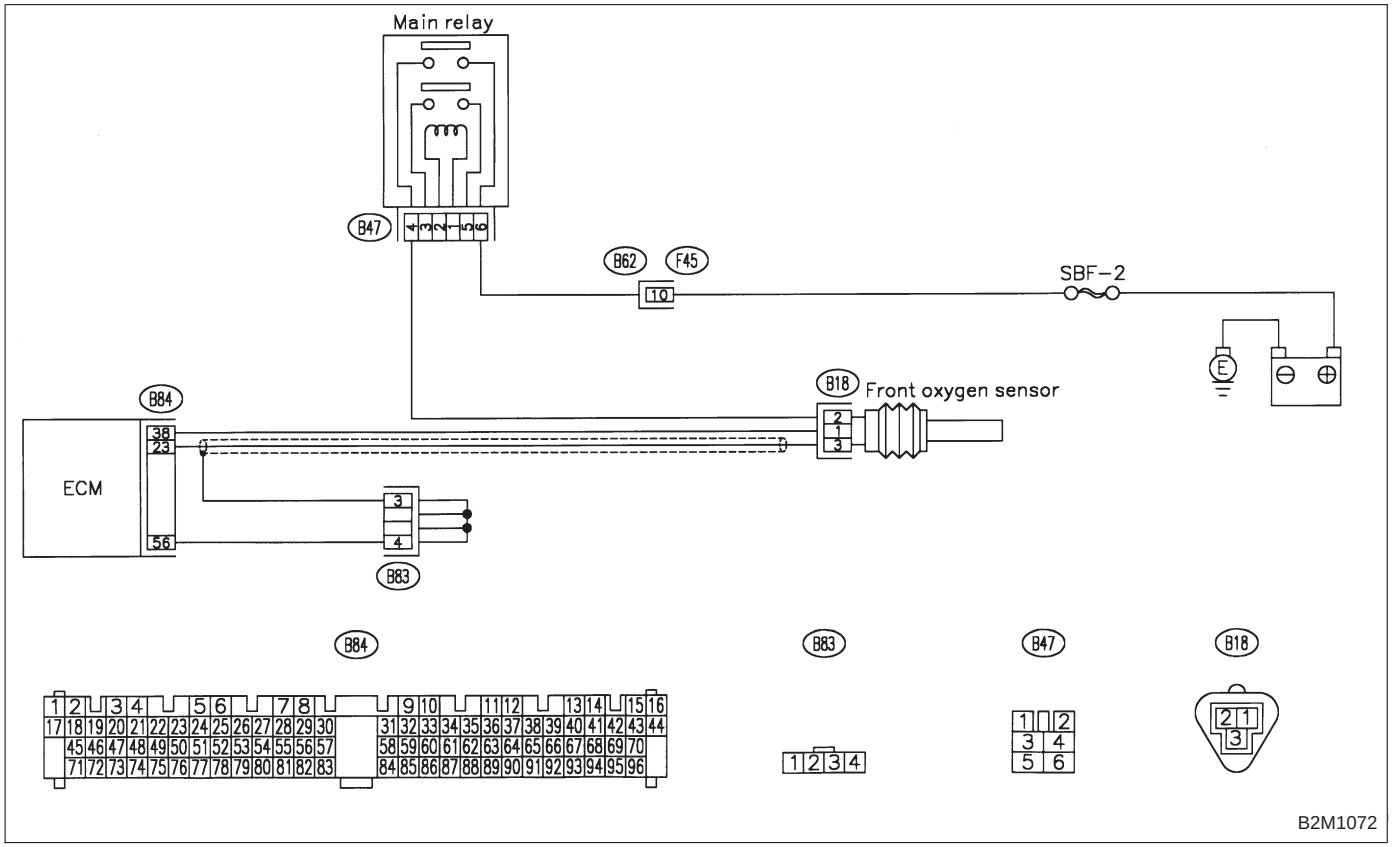


N: DTC P0130 — FRONT OXYGEN SENSOR CIRCUIT MALFUNCTION —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

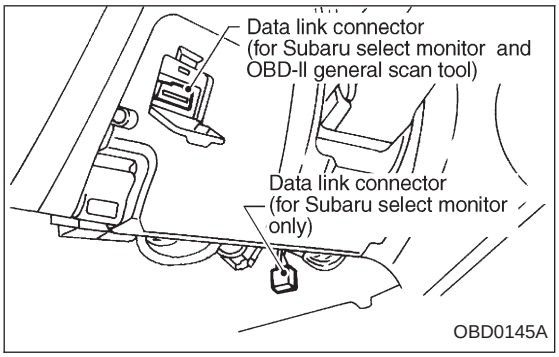
10N1	CHECK FOR OTHER CAUSES AFFECTING EXHAUST GAS.

CHECK ***: Is CO % more than 2 % after engine warm-up?***

YES : Check fuel system.

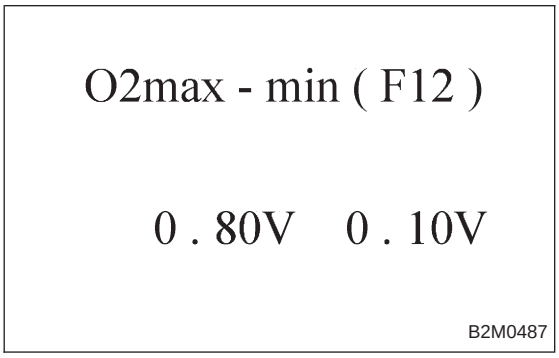
NOTE:
- Check for use of improper fuel.
- Check if engine oil or coolant level is extremely low.

NO : Go to step **10N2**.



10N2	CHECK FRONT OXYGEN SENSOR DATA.

1) Turn ignition switch to OFF.
2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Start engine and Turn the Subaru Select Monitor and the OBD-II general scan tool switch to ON.
4) Warm-up the engine until coolant temperature is above 70°C (160°F) and keep the engine speed at 2,000 rpm to 3,000 rpm for one minute.



5) Read data on Subaru Select Monitor or the OBD-II general scan tool.
- Subaru Select Monitor

Designate mode using function key.

Function mode: F12

- F12: Front oxygen sensor max. and min. output signals are indicated at the same time.

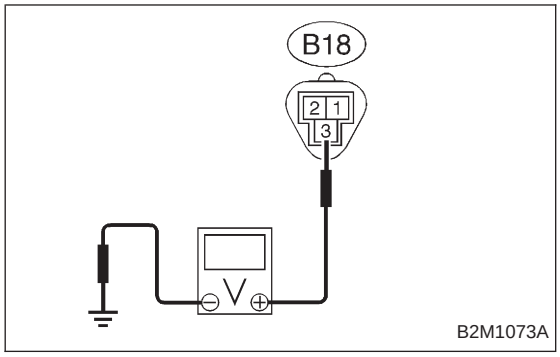
CHECK ***: Is the difference of voltage less than 0.1 V between the value of max. output and min. output with function mode F12?***

YES : Go to step **10N3**.

NO : Replace front oxygen sensor.

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



10N3	**CHECK HARNESS BETWEEN FRONT OXYGEN SENSOR AND ECM CONNECTOR.**

1) Turn ignition switch to OFF.
2) Disconnect connector from front oxygen sensor.
3) Turn ignition switch to ON.
4) Measure voltage between front oxygen sensor harness connector and engine ground.

CHECK ***: Connector & terminal (B18) No. 3 (+) — Engine ground (−): Is the voltage more than 0.2 V?***

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and front oxygen sensor connector
- Poor contact in the ECM connector

CHECK ***: Is there poor contact in front oxygen sensor connector?***

YES : Repair poor contact in front oxygen sensor connector.

NO : Replace front oxygen sensor.

OBD (FB1)

P0133 <FO2_R>

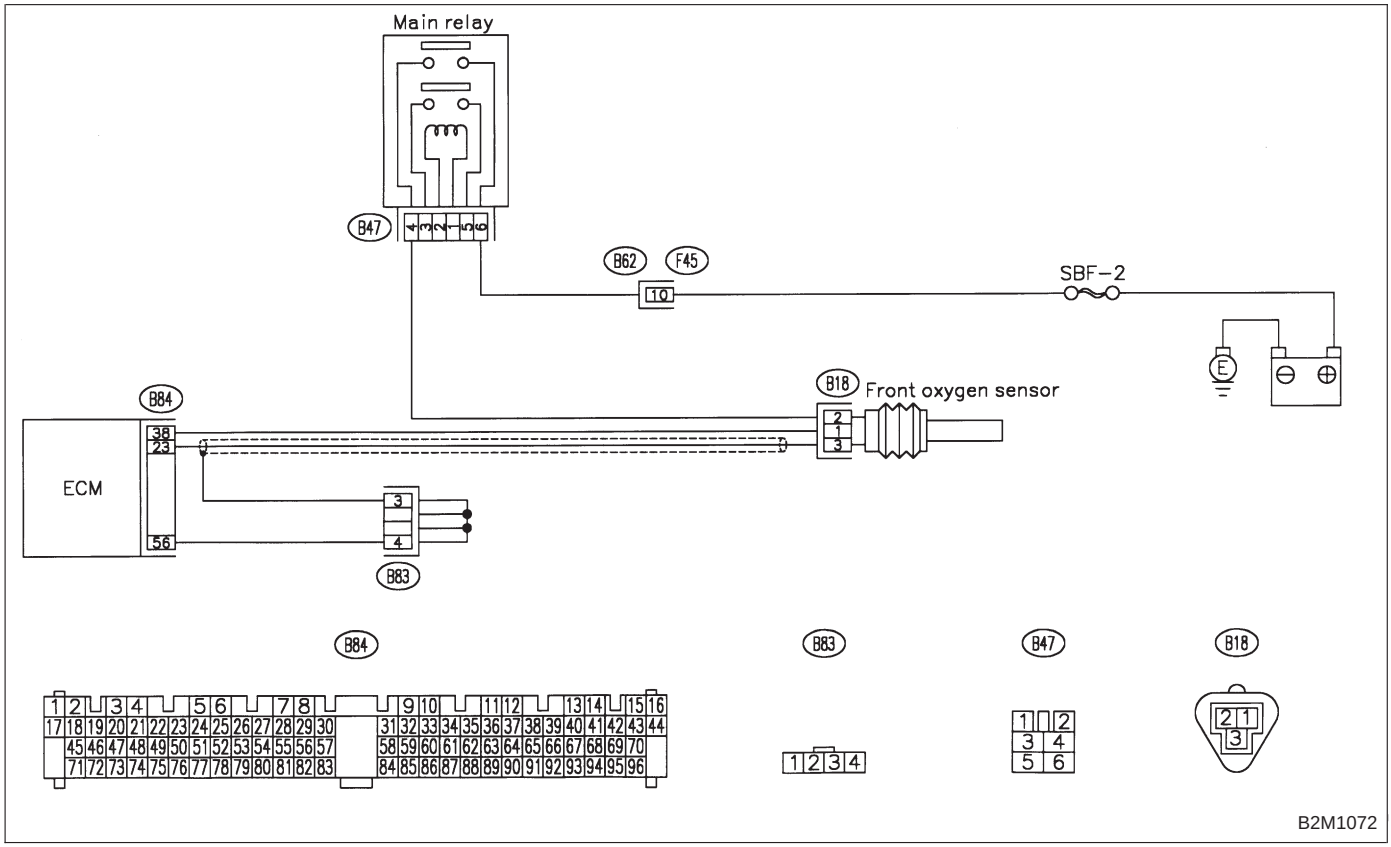
OBD0209

O: DTC P0133 — FRONT OXYGEN SENSOR CIRCUIT SLOW RESPONSE —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10O1	CHECK DTC P0130 ON DISPLAY.

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0130?***

YES : Inspect DTC P0130 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect DTC P0133.

NO : Go to step **10O2**.

10O2	CHECK EXHAUST SYSTEM.

CHECK ***: Is there a fault in exhaust system?***

NOTE:
Check the following items.
- Loose installation of front portion of exhaust pipe onto cylinder heads
- Loose connection between front exhaust pipe and front catalytic converter
- Damage of exhaust pipe resulting in a hole

YES : Repair exhaust system.

NO : Replace front oxygen sensor.

OBD (FB1)

P0135 <FO2H>

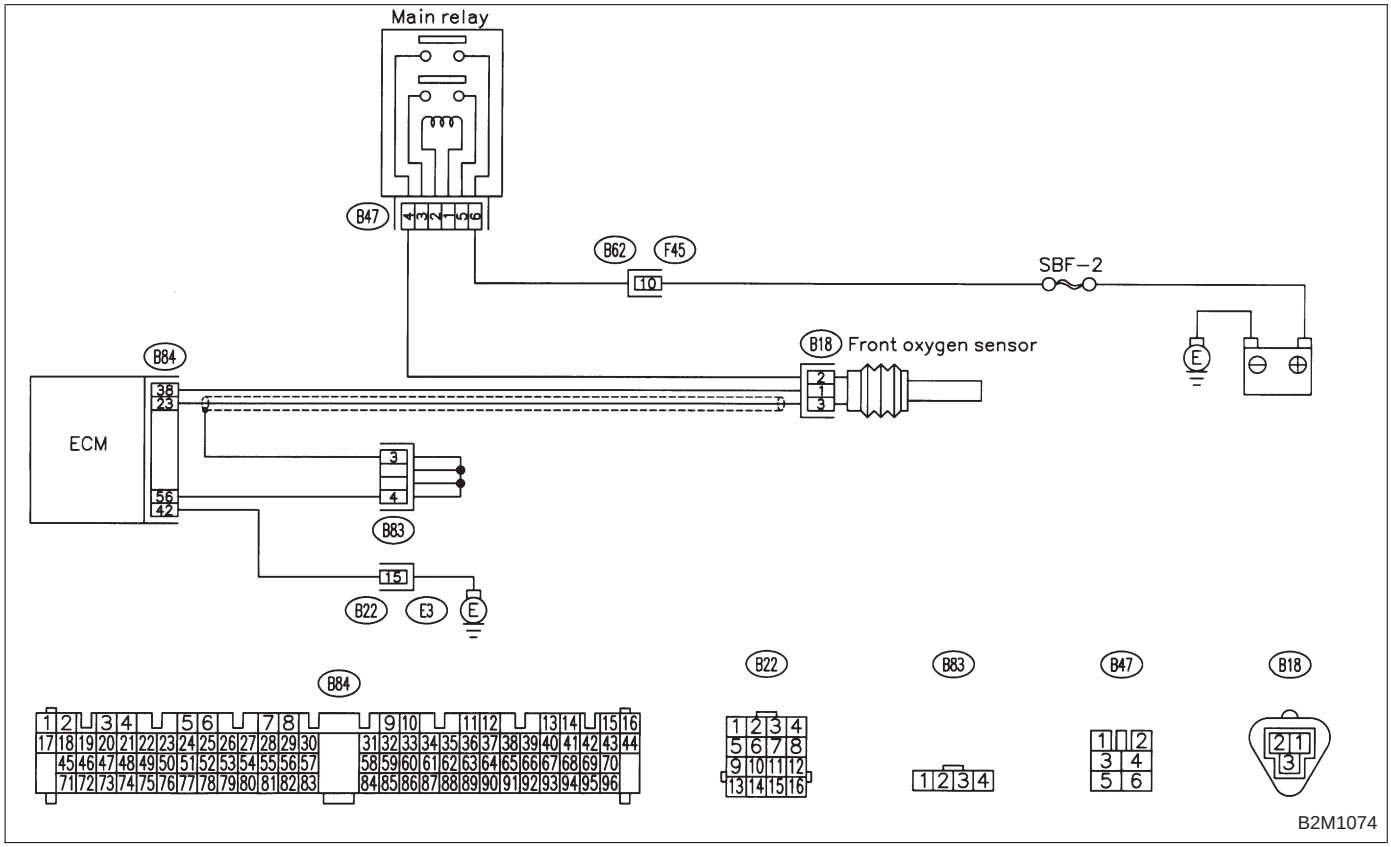
OBD0212

P: DTC P0135 — FRONT OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



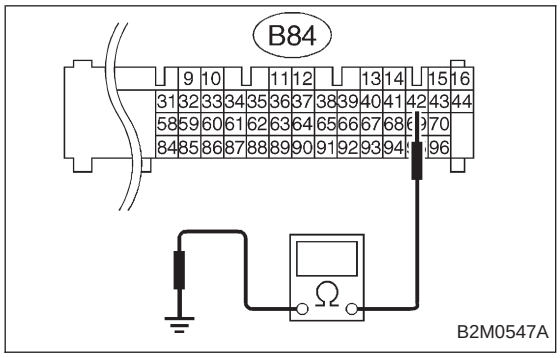
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10P1	CHECK DTC P0141 ON DISPLAY.

CHECK : ***Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0135 and P0141 at the same time?***

YES : Go to next step 1).

NO : Go to step **10P2**.



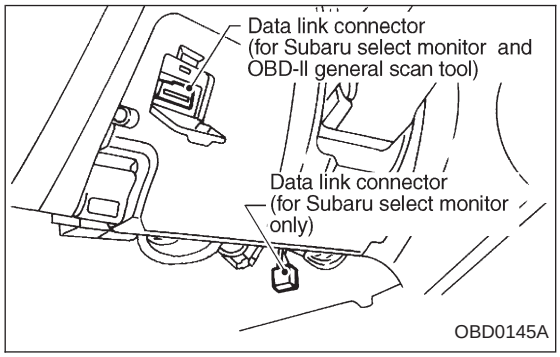
1) Turn ignition switch to OFF.
2) Disconnect connector from ECM.
3) Measure resistance of harness between ECM connector and chassis ground.

CHECK : ***Connector & terminal (B84) No. 42 — Chassis ground: Is the resistance less than 5 Ω?***

YES : Repair poor contact in ECM connector.

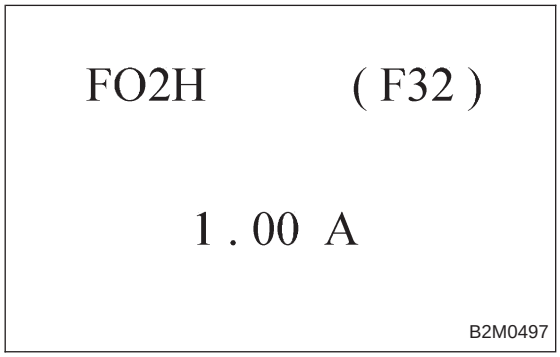
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and coupling connector (B22)
- Open circuit in harness between coupling connector (B22) and engine grounding terminal
- Poor contact in front oxygen sensor connector
- Poor contact in coupling connector (B22)



10P2	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
4) Start engine.



5) Read data on Subaru Select Monitor or OBD-II general scan tool.
- Subaru Select Monitor

Designate mode using function key.

Function mode: F32

- F32: Front oxygen sensor heater current is indicated.

CHECK : ***Is the value more than 0.2 A in function mode F32?***

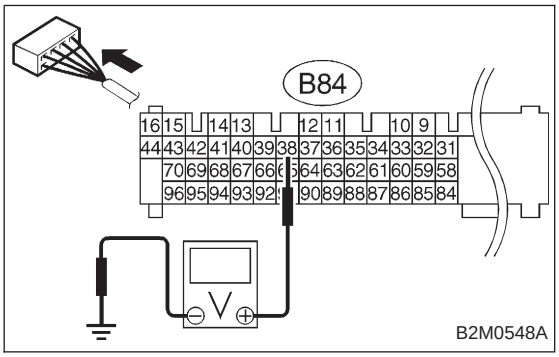
YES : Repair connector.

NOTE:
In this case, repair the following:
- Poor contact in front oxygen sensor connector
- Poor contact in ECM connector

NO : Go to step **10P3**.

- OBD-II scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



10P3	CHECK OUTPUT SIGNAL FROM ECM. (USING VOLTAGE METER.)

1) Start and idle the engine.
2) Measure voltage between ECM connector and chassis ground.

CHECK : ***Connector & terminal (B84) No. 38 (+) — Chassis ground (−): Is the voltage less than 1.0 V?***

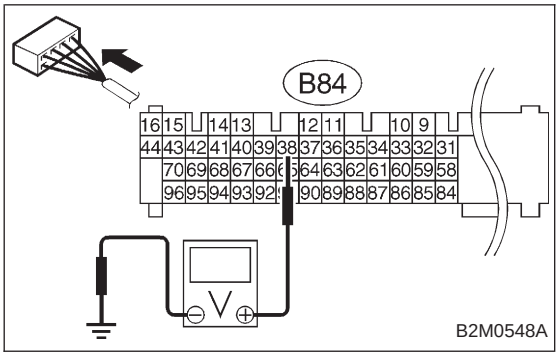
YES : Go to step **10P4**.

NO : Go to next CHECK .

CHECK : ***Does the voltage change less than 1.0 V by shaking harness and connector of ECM while monitoring the value with voltage meter?***

YES : Repair poor contact in ECM connector.

NO : Go to next step 3).

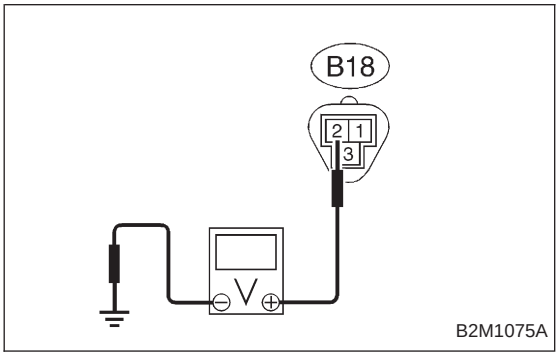


3) Disconnect connector from front oxygen sensor.
4) Measure voltage between ECM connector and chassis ground.

CHECK : ***Connector & terminal (B84) No. 38 (+) — Chassis ground (−): Is the voltage less than 1.0 V?***

YES : Replace ECM.

NO : Repair battery short circuit in harness between ECM and front oxygen sensor connector. After repair, replace ECM.

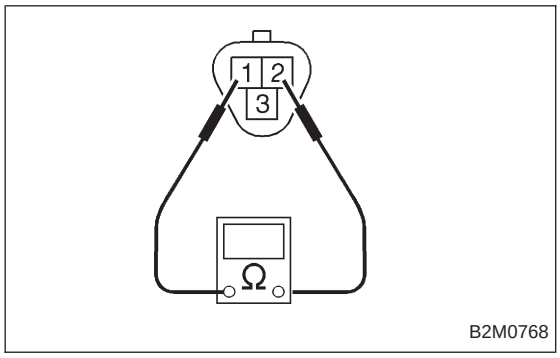


10P4	CHECK POWER SUPPLY TO FRONT OXYGEN SENSOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from front oxygen sensor.
3) Turn ignition switch to ON.
4) Measure voltage between front oxygen sensor connector and engine ground.

CHECK : ***Connector & terminal (B18) No. 2 (+) — Engine ground (−): Is the voltage more than 10 V?***

YES : Go to step **10P5**.
NO : Repair power supply line.
NOTE:
In this case, repair the following:
- Open circuit in harness between main relay and front oxygen sensor connector
- Poor contact in front oxygen sensor connector
- Poor contact in main relay connector



10P5	CHECK FRONT OXYGEN SENSOR.

1) Turn ignition switch to OFF.
2) Measure resistance between front oxygen sensor connector terminals.

CHECK ***: Terminals No. 1 — No. 2: Is the resistance less than 30 Ω?***

YES : Repair harness and connector.
NOTE:
In this case, repair the following:
- Open circuit in harness between front oxygen sensor and ECM connector
- Poor contact in front oxygen sensor connector
- Poor contact in ECM connector

NO : Replace front oxygen sensor.

OBD (FB1)

P0136 <RO2_V>

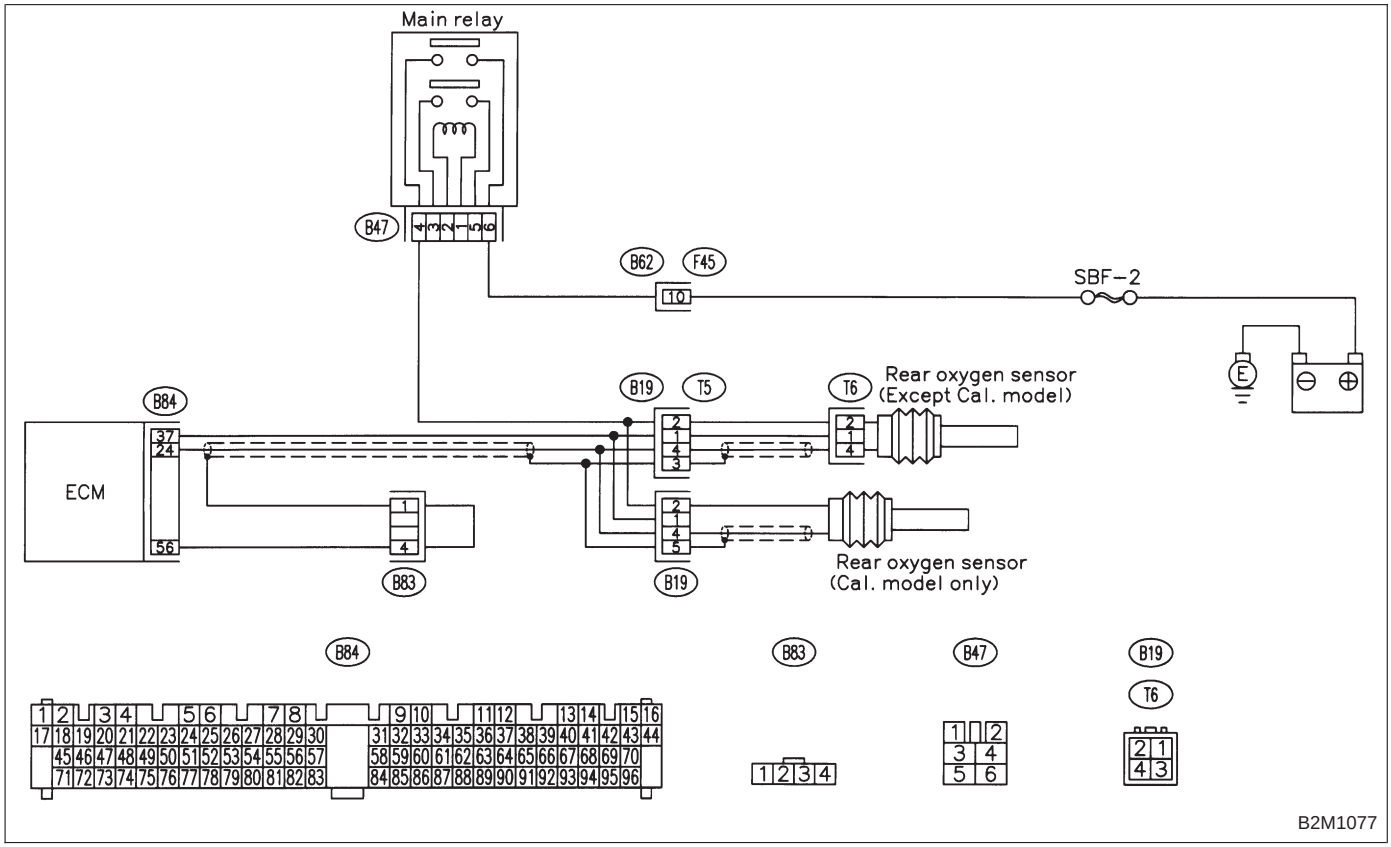
OBD0220

Q: DTC P0136 — REAR OXYGEN SENSOR CIRCUIT MALFUNCTION —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



B2M1077

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10Q1	CHECK DTC P0130 ON DISPLAY.

CHECK : ***Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0130?***

YES : Go to step **10Q2**.

NO : Go to step **10Q3**.

10Q2	CHECK FAILURE CAUSE OF P0130.

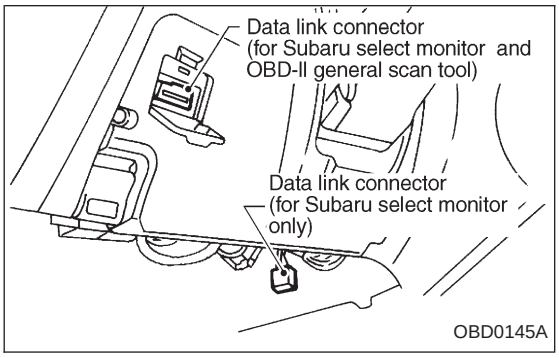
Perform the step 1 of DTC P0130.

CHECK : ***Is the failure cause of P0130 in the fuel system?***

YES : Check fuel system.

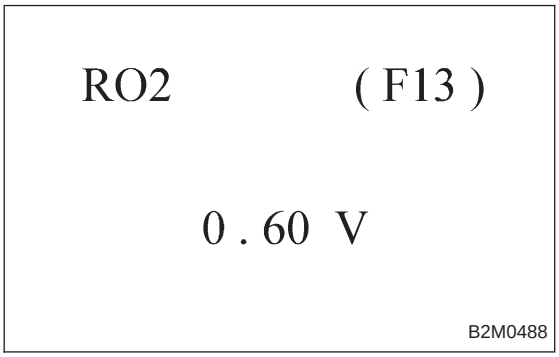
NOTE:
In this case, it is not necessary to inspect DTC P0136.

NO : Go to step **10Q3**.



10Q3	CHECK REAR OXYGEN SENSOR DATA.

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or OBD-II general scan tool to data link connector.
3) Start the engine, and turn Subaru Select Monitor or OBD-II general scan tool switch to ON.
4) Warm-up the engine until engine coolant temperature is above 70°C (160°F), and keep the engine speed at 2,000 rpm to 3,000 rpm for two minutes.



5) Read data on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor

Designate mode using function key.

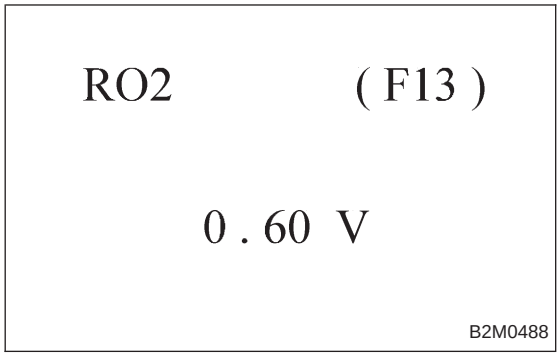
Function mode: F13

- F13: Rear oxygen sensor output signal is indicated.

CHECK : ***Does the value fluctuate in function mode F13?***

YES : Go to step **10Q5**.

NO : Go to next CHECK .



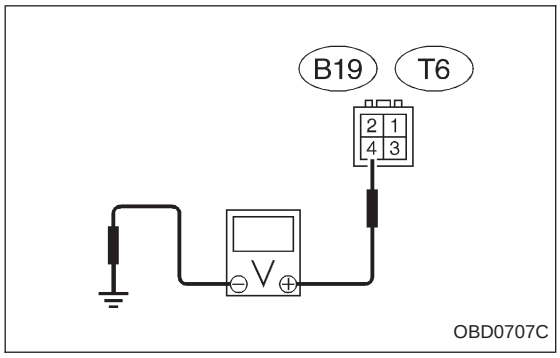
CHECK : ***Is the value fixed between 0.2 and 0.4 V in function mode F13?***

YES : Go to step **10Q4**.

NO : Replace rear oxygen sensor.

● OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



10Q4	CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from rear oxygen sensor.
3) Turn ignition switch to ON.
4) Measure voltage between rear oxygen sensor harness connector and engine ground or chassis ground.

CHECK : ***Connector & terminal***
● 2200 cc California spec. vehicles
(B19) No. 4 (+) — Engine ground (−):
● Except 2200 cc California spec. vehicles
(T6) No. 4 (+) — Chassis ground (−):
Is the voltage more than 0.2 V?

YES : Replace rear oxygen sensor.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
● Open circuit in harness between rear oxygen sensor and ECM connector
● Poor contact in rear oxygen sensor connector
● Poor contact in ECM connector
● Poor contact in rear oxygen sensor connecting harness connector (Except 2200 cc California spec. vehicles)

10Q5	CHECK EXHAUST SYSTEM.

CHECK : ***Is there a fault in exhaust system?***

NOTE:
Check the following items.
● Loose installation of portions
● Damage (crack, hole etc.) of parts
● Looseness and ill fitting of parts between front oxygen sensor and rear oxygen sensor

YES : Repair or replace faulty parts.

NO : Replace rear oxygen sensor.

OBD	(FB1)
P0139	<RO2_R>

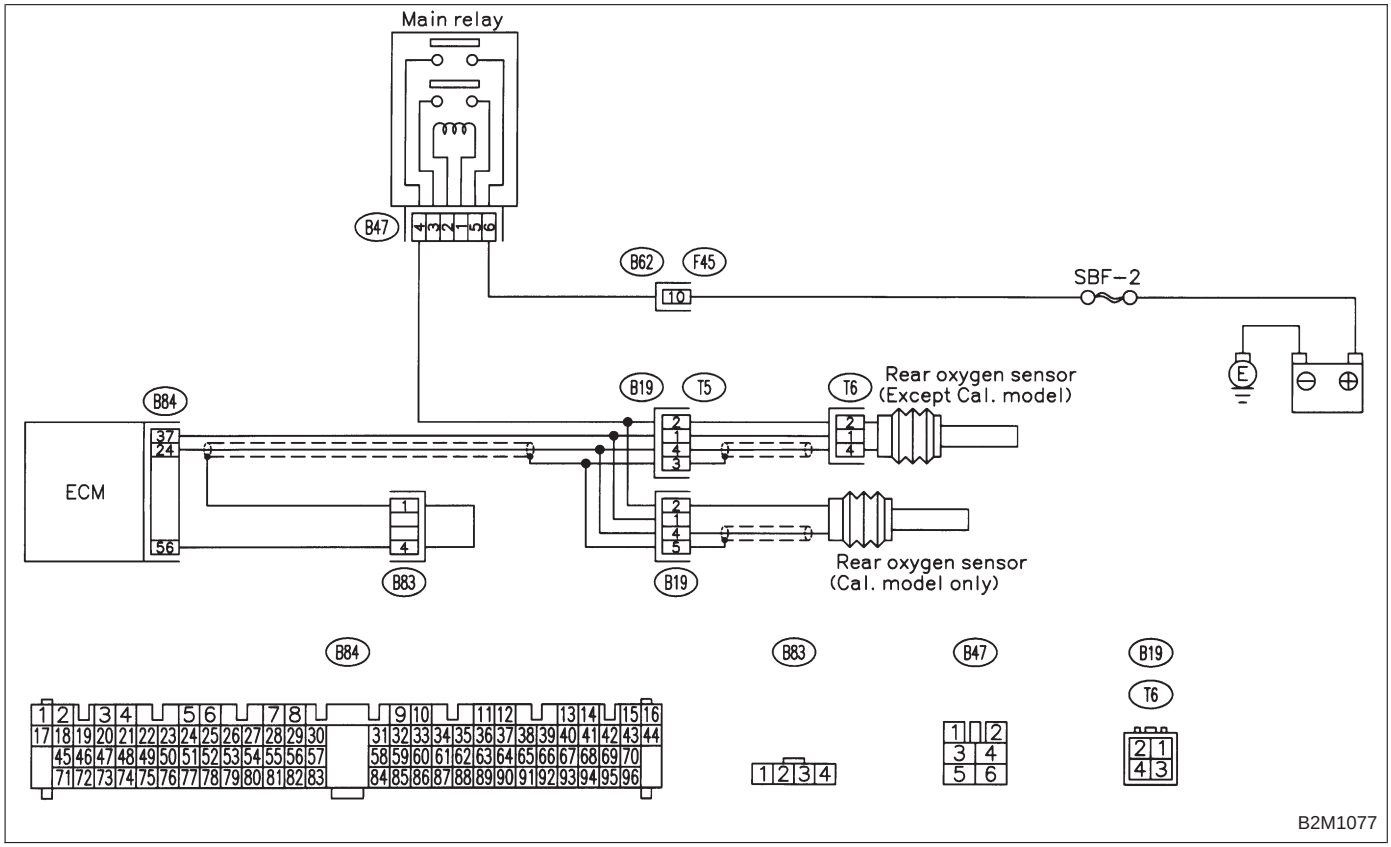
OBD0229

R: DTC P0139 — REAR OXYGEN SENSOR CIRCUIT SLOW RESPONSE —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10R1	CHECK DTC P0136 ON DISPLAY.

CHECK : ***Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0136?***

YES : Inspect DTC P0136 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect DTC P0139.

NO : Replace rear oxygen sensor.

OBD	(FB1)
P0141	<RO2H>

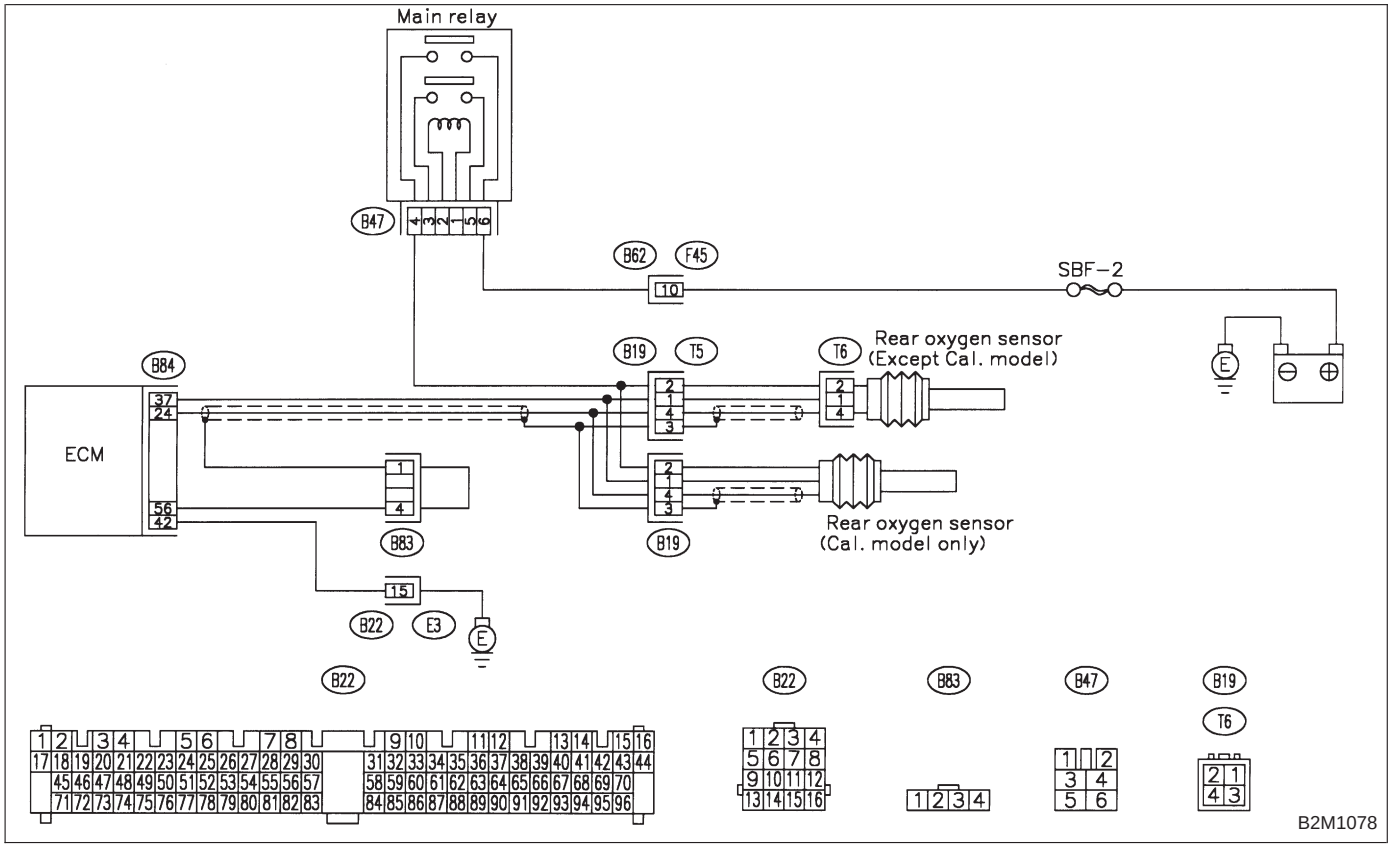
OBD0232

S: DTC P0141 — REAR OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



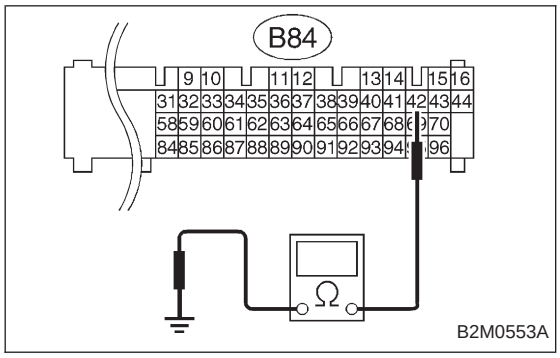
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10S1	CHECK DTC P0135 ON DISPLAY.

CHECK : ***Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0141 and P0135 at the same time?***

YES : Go to next step 1).

NO : Go to step **10S2**.



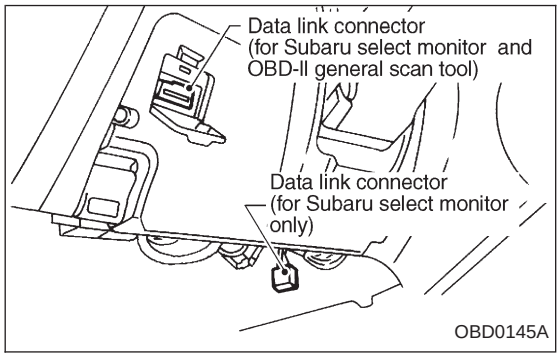
1) Turn ignition switch to OFF.
2) Disconnect connector from ECM.
3) Measure resistance of harness between ECM connector and chassis ground.

CHECK : ***Connector & terminal (B84) No. 42 — Chassis ground: Is the resistance less than 5 Ω?***

YES : Repair poor contact in ECM connector.

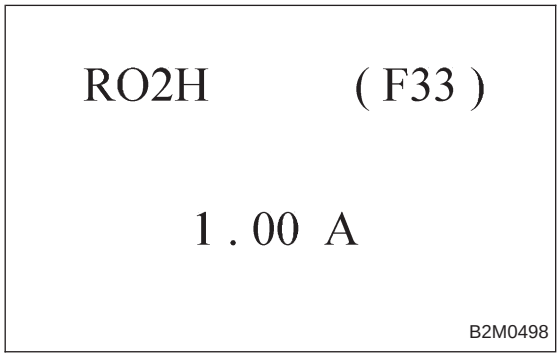
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and coupling connector (B22)
- Open circuit in harness between coupling connector (B22) and engine grounding terminal
- Poor contact in rear oxygen sensor connector
- Poor contact in rear oxygen sensor connecting harness connector (B19)
- Poor contact in coupling connector (B22)



10S2	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
4) Start engine.



5) Read data on Subaru Select Monitor or OBD-II general scan tool.
- Subaru Select Monitor

Designate mode using function key.

Function mode: F33

- F33: Rear oxygen sensor heater current is indicated.

CHECK : ***Is the value more than 0.2 A in function mode F33?***

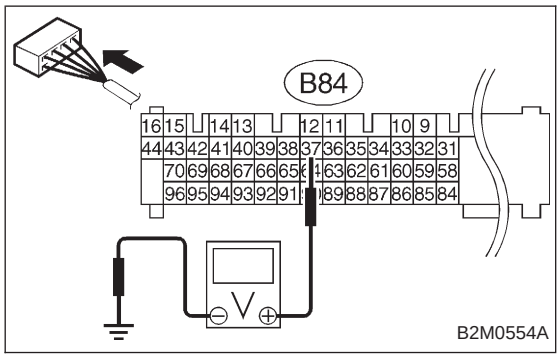
YES : Repair connector.

NOTE:
In this case, repair the following:
- Poor contact in rear oxygen sensor connector
- Poor contact in rear oxygen sensor connecting harness connector
- Poor contact in ECM connector

NO : Go to step **10S3**.

- OBD-II scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



10S3	CHECK OUTPUT SIGNAL FROM ECM. (USING VOLTAGE METER.)

1) Start and idle the engine.
2) Measure voltage between ECM connector and chassis ground.

CHECK : ***Connector & terminal (B84) No. 37 (+) — Chassis ground (−): Is the voltage less than 1.0 V?***

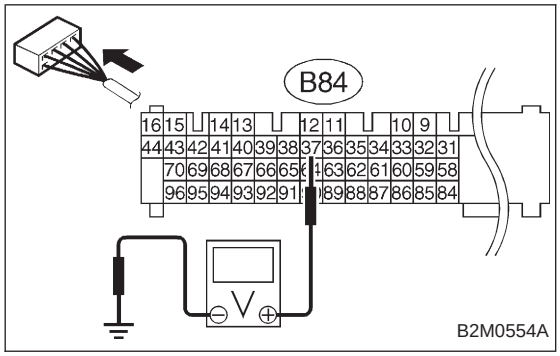
YES : Go to step **10S4**.

NO : Go to next CHECK .

CHECK : ***Does the voltage change less than 1.0 V by shaking harness and connector of ECM while monitoring the value with voltage meter?***

YES : Repair poor contact in ECM connector.

NO : Go to next step 3).

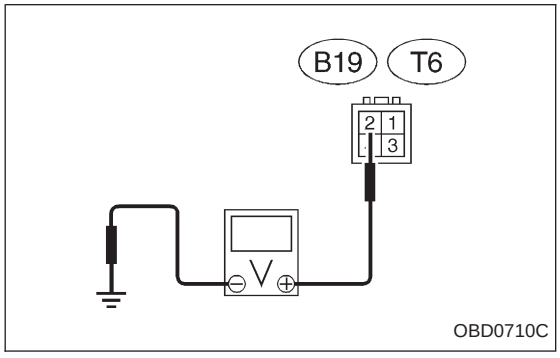


3) Disconnect connector from rear oxygen sensor.
4) Measure voltage between ECM connector and chassis ground.

CHECK : ***Connector & terminal (B84) No. 37 (+) — Chassis ground (−): Is the voltage less than 1.0 V?***

YES : Replace ECM.

NO : Repair battery short circuit in harness between ECM and rear oxygen sensor connector. After repair, replace ECM.



10S4	CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from rear oxygen sensor.
3) Turn ignition switch to ON.
4) Measure voltage between rear oxygen sensor connector and engine ground or chassis ground.

CHECK : ***Connector & terminal***
- ***2200 cc California spec. vehicles***

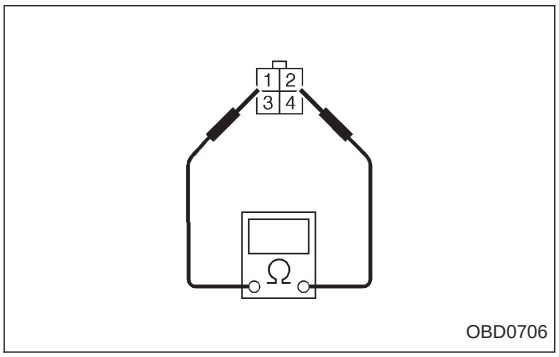
(B19) No. 2 (+) — Engine ground (−):

● ***Except 2200 cc California spec. vehicles (T6) No. 2 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Go to step **10S5**.

NO : Repair power supply line.

NOTE:
In this case, repair the following:
● Open circuit in harness between main relay and rear oxygen sensor connector
● Poor contact in rear oxygen sensor connector
● Poor contact in rear oxygen sensor connecting harness connector (Except 2200 cc California spec. vehicles)



OBD0706

10S5	CHECK REAR OXYGEN SENSOR.

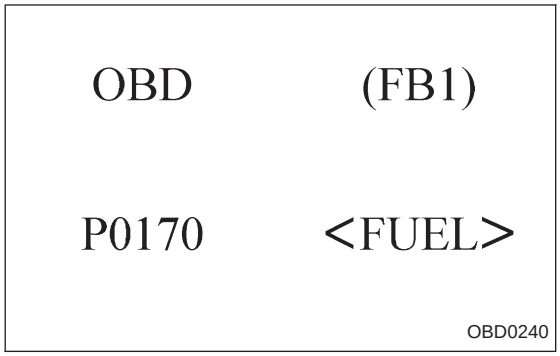
1) Turn ignition switch to OFF.
2) Measure resistance between rear oxygen sensor connector terminals.

CHECK : ***Terminals No. 1 — No. 2: Is the resistance less than 30 Ω?***

YES : Repair harness and connector.

NOTE:
In this case, repair the following:
● Open circuit in harness between rear oxygen sensor and ECM connector
● Poor contact in rear oxygen sensor connector
● Poor contact in ECM connector
● Poor contact in rear oxygen sensor connecting harness connector

NO : Replace rear oxygen sensor.



T: DTC P0170
— FUEL TRIM MALFUNCTION —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODE.
<Ref. to 2-7 [T3D0] and [T3E0].>

10T1	CHECK EXHAUST SYSTEM.

CHECK : ***Are there holes or loose bolts on exhaust system?***

YES : Repair exhaust system.

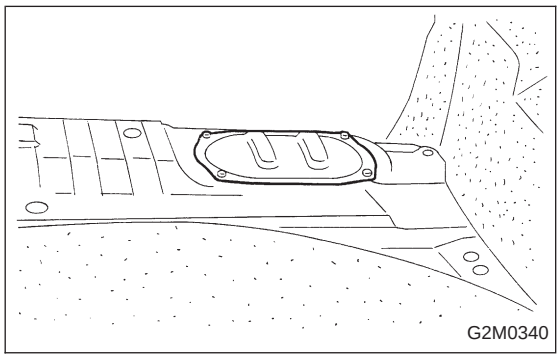
NO : Go to step **10T2**.

10T2	CHECK AIR INTAKE SYSTEM.

CHECK : ***Are there holes, loose bolts or disconnection of hose on air intake system?***

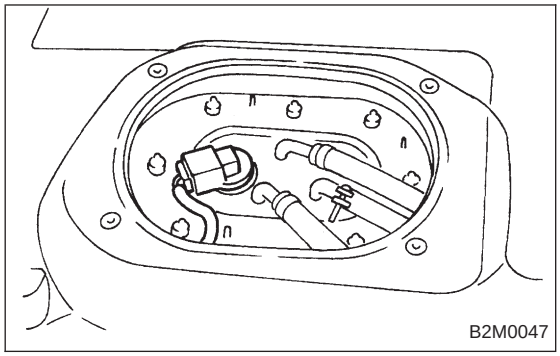
YES : Repair air intake system.

NO : Go to step **10T3**.

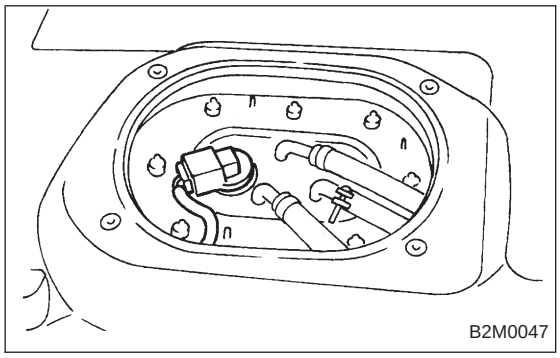


10T3	CHECK FUEL PRESSURE.

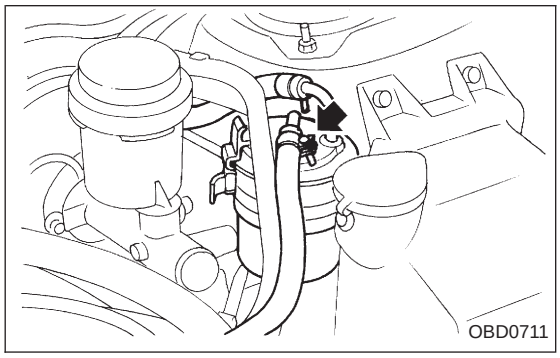
1) Release fuel pressure.
   (1) Remove fuel pump access hole lid located on the right rear of trunk compartment floor (Sedan) or luggage compartment floor (Wagon).



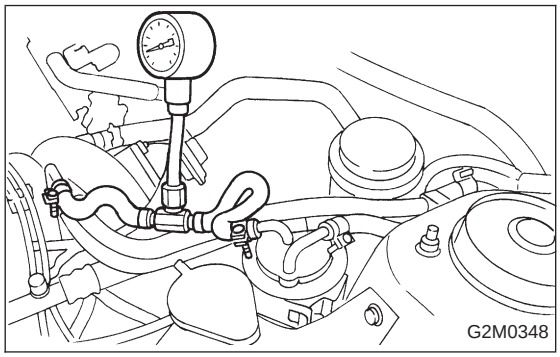
(2) Disconnect connector from fuel tank.
(3) Start the engine, and run it until it stalls.
(4) After stopping the engine, crank the engine for 5 to 7 seconds to reduce fuel pressure.
(5) Turn ignition switch to OFF.



2) Connect connector to fuel tank.



3) Disconnect fuel delivery hose from fuel filter, and connect fuel pressure gauge.



4) Start the engine and idle while gear position is neutral.
5) Measure fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold.

CHECK ***: Is fuel pressure between 226 and 275 kPa (2.3 — 2.8 kg/cm^2, 33 — 40 psi)?***

YES : Go to next step 6).

NO : Repair the following items.

Fuel pressure too high	• Clogged fuel return line or bent hose
Fuel pressure too low	• Improper fuel pump discharge • Clogged fuel supply line

6) After connecting pressure regulator vacuum hose, measure fuel pressure.

CHECK ***: Is fuel pressure between 157 and 206 kPa (1.6 — 2.1 kg/cm^2, 23 — 30 psi)?***

YES : Go to step **10T4**.

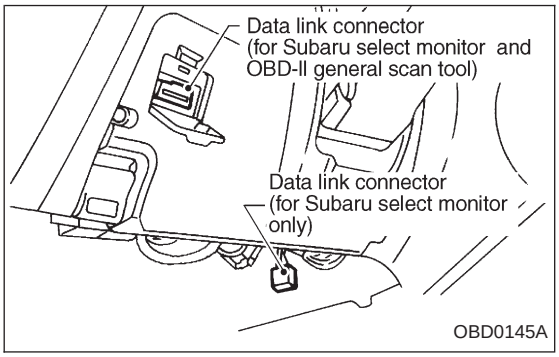
NO : Repair the following items.

Fuel pressure too high	● Faulty pressure regulator ● Clogged fuel return line or bent hose
Fuel pressure too low	● Faulty pressure regulator ● Improper fuel pump discharge ● Clogged fuel supply line

WARNING:
Before removing fuel pressure gauge, release fuel pressure.

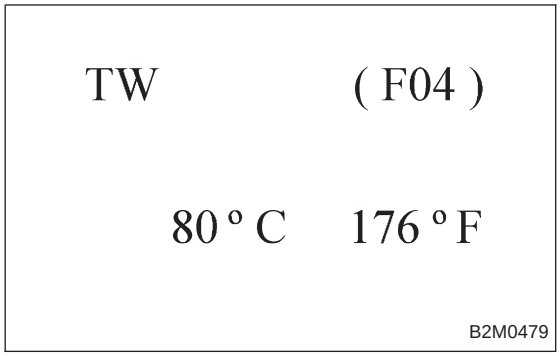
NOTE:

● If fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.
● If out of specification as measured at this step, check or replace pressure regulator and pressure regulator vacuum hose.



10T4	**CHECK ENGINE COOLANT TEMPERATURE SENSOR.** **<REF. TO 2-7 H: DTC P0116 [T10H0] OR I: DTC P0117 [T10I0].>**

1) Turn ignition switch to OFF.
2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Start the engine and warm-up completely.



4) Read data on Subaru Select Monitor or the OBD-II general scan tool.

● Subaru Select Monitor
Designate mode using function key.

Function mode: F04

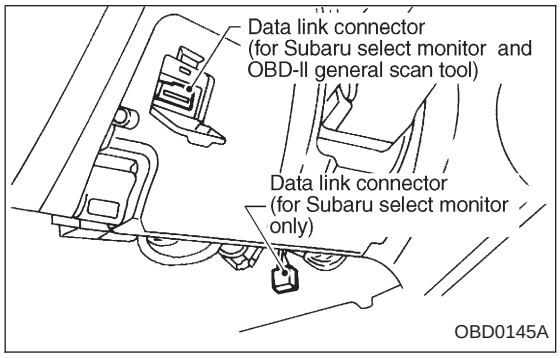
● F04: Water temperature is indicated in "°C" and "°F".

CHECK ***: Is temperature greater than 60°C or 140°F in function mode F04?***

YES : Go to step **10T5**.

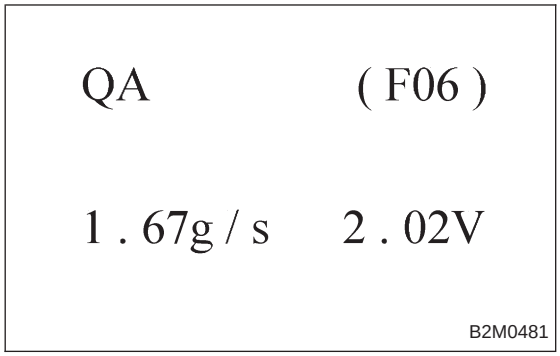
NO : Replace engine coolant temperature sensor.

● OBD-II general scan tool
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



10T5	CHECK MASS AIR FLOW SENSOR.

1) Turn ignition switch to OFF.
2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F).
4) Place the selector lever in "N" or "P" position.
5) Turn A/C switch to OFF.
6) Turn all accessory switches to OFF.



7) Read data on Subaru Select Monitor or OBD-II general scan tool.

● Subaru Select Monitor
Designate mode using function key.

Function mode: F06

● F06: Mass air flow and voltage input from mass air flow sensor are shown on display.

CHECK ***: Is the voltage in function mode F06 within the specifications shown in the following table?***

Model	Engine speed	Specified value
2200 cc	Idling	1.7 — 3.3 (g/sec)
	2,500 rpm	7.1 — 14.2 (g/sec)
2500 cc	Idling	2.2 — 4.2 (g/sec)
	2,500 rpm	8.6 — 14.5 (g/sec)

YES : Contact with SOA service.
NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

NO : Replace mass air flow sensor.

● OBD-II general scan tool
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

OBD (FB1)

P0181 <TNKT_F>

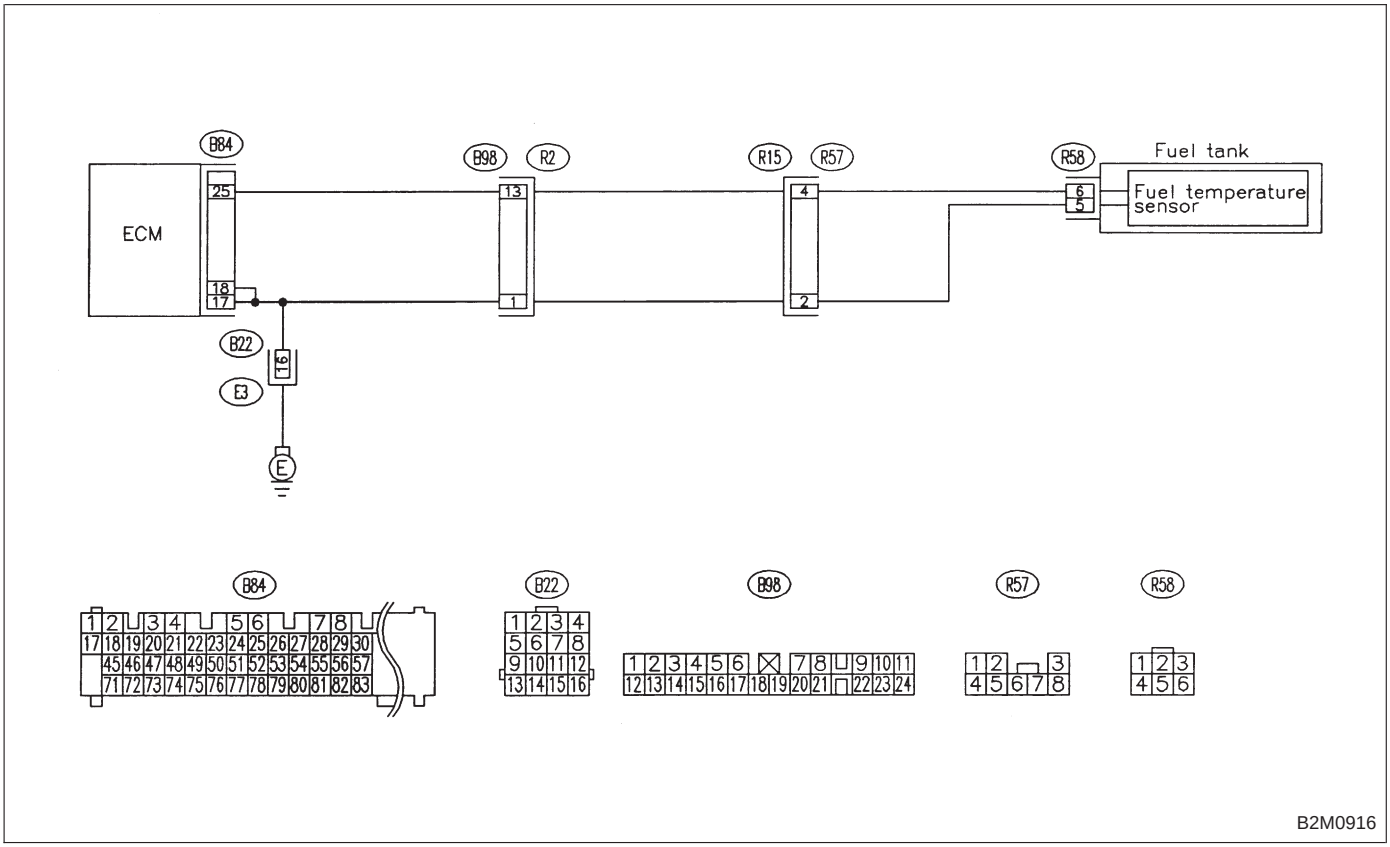
H2M1350

U: DTC P0181 — FUEL TEMPERATURE SENSOR A CIRCUIT RANGE/PERFORMANCE PROBLEM —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



B2M0916

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10U1	**CHECK DTC P0182 OR P0183 ON DISPLAY.**

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0182 or P0183?***

YES : Inspect DTC P0182 or P0183 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect DTC P0181.

NO : Replace fuel temperature sensor.

OBD (FB1)

P0182 <TNKT_LOW>

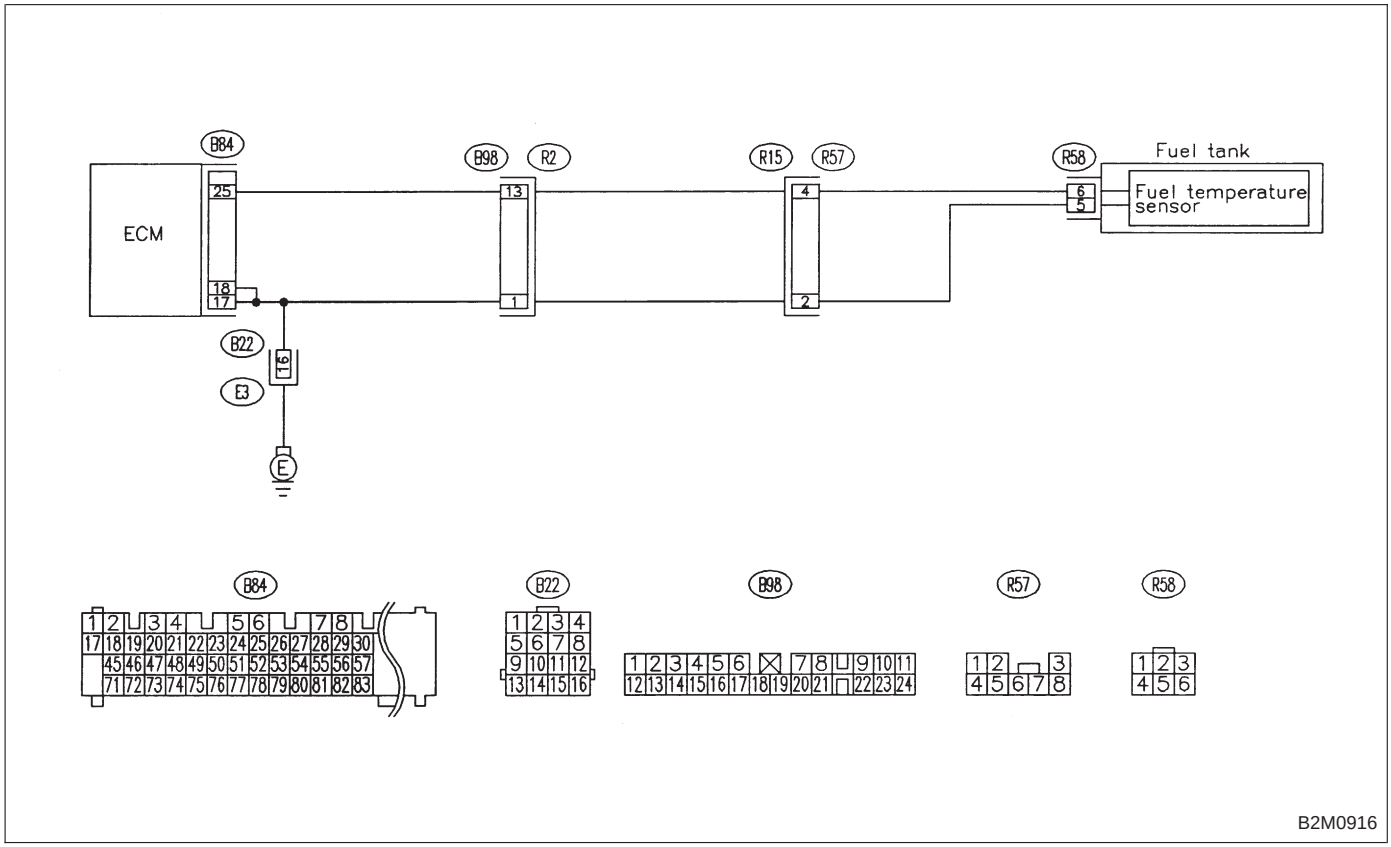
B2M1079

V: DTC P0182 — FUEL TEMPERATURE SENSOR A CIRCUIT LOW INPUT —

DTC DETECTING CONDITION:

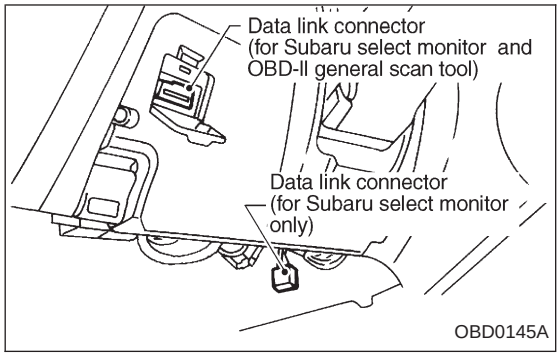
- Immediately at fault recognition

WIRING DIAGRAM:



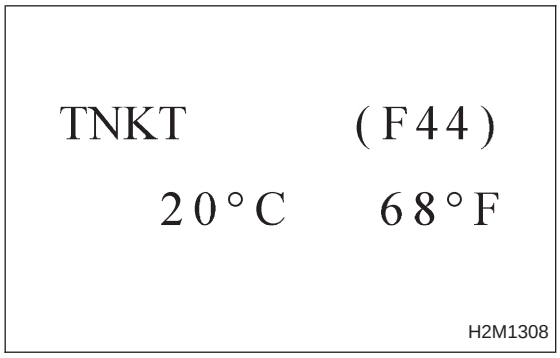
B2M0916

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10V1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
4) Start engine.



5) Read data on Subaru Select Monitor or OBD-II general scan tool.

● Subaru Select Monitor
Designate mode using function key.

Function mode: F44

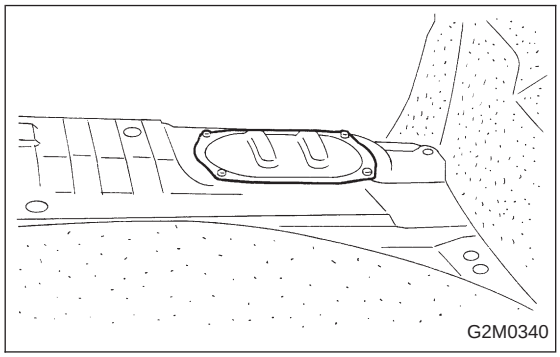
● F44: Fuel temperature is indicated in "°C" and "°F".

CHECK ***: Is the value greater than 150°C or 300°F in function mode F44?***

YES : Go to step **10V2**.

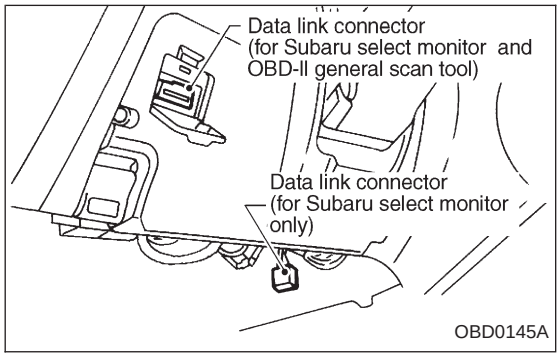
NO : Even if MIL lights up, the circuit has returned to a normal condition at this time.

● OBD-II general scan tool
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

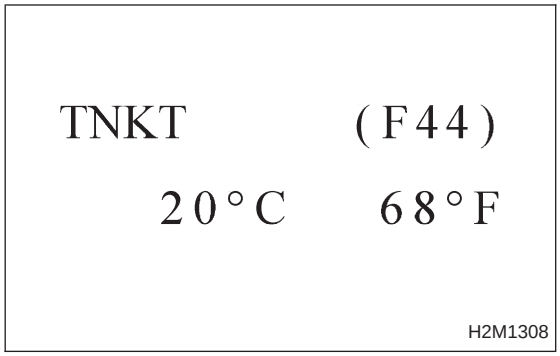


10V2	CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Remove access hole lid.
3) Disconnect connector from fuel pump.



4) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
5) Turn ignition switch and Subaru Select Monitor or OBD-II general scan tool switch to ON.



6) Read data on Subaru Select Monitor or the OBD-II general scan tool.

● Subaru Select Monitor

Designate mode using function key.

Function mode: F44

● F44: Fuel temperature is indicated in "°C" and "°F".

CHECK ***: Is the value less than −40°C or −40°F in function mode F44?***

YES : Replace fuel temperature sensor.

NO : Repair ground short circuit in harness between fuel pump and ECM connector.

● OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

OBD (FB1)

P0183 <TNKT_HI>

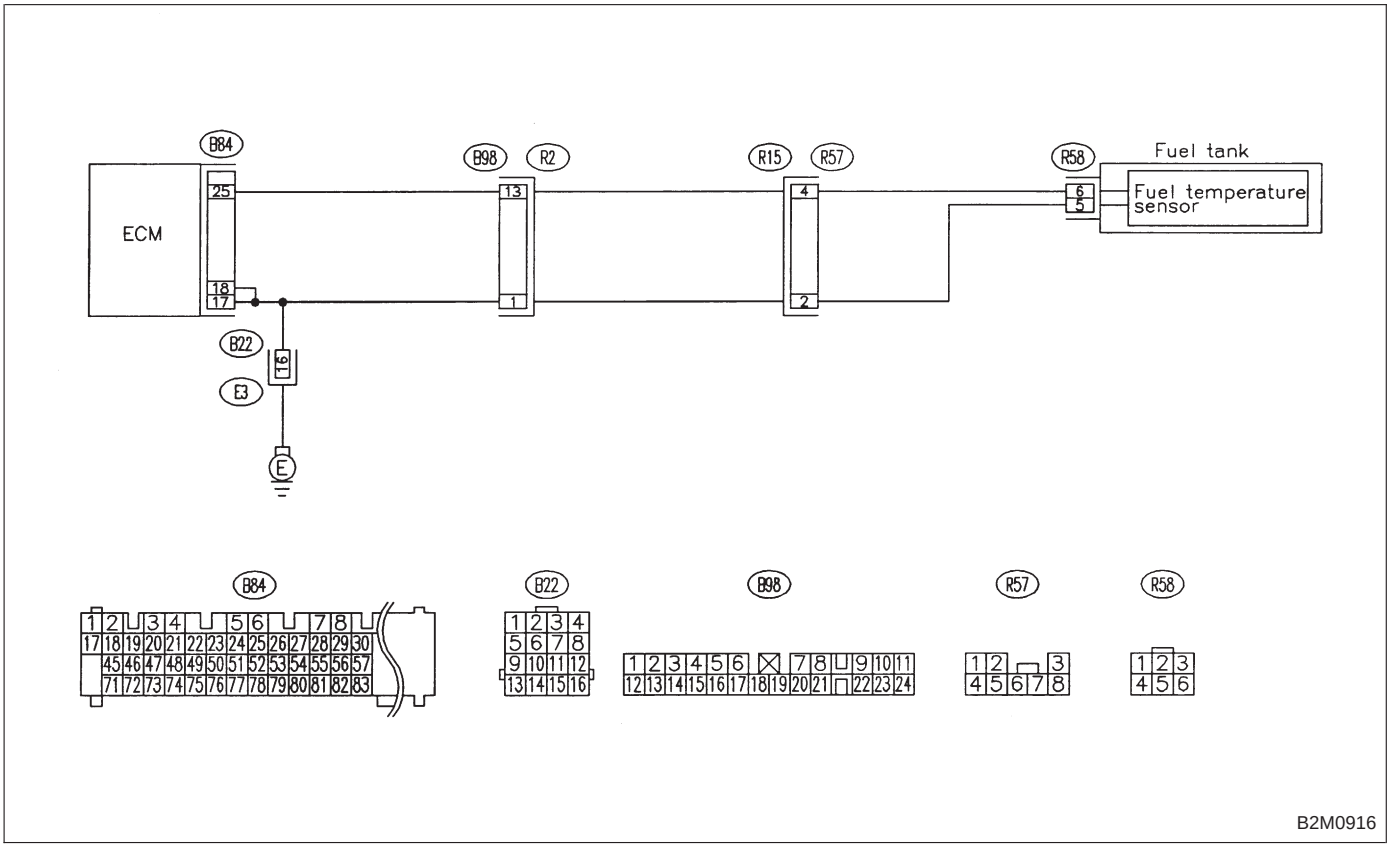
B2M1080

W: DTC P0183 — FUEL TEMPERATURE SENSOR A CIRCUIT HIGH INPUT —

DTC DETECTING CONDITION:

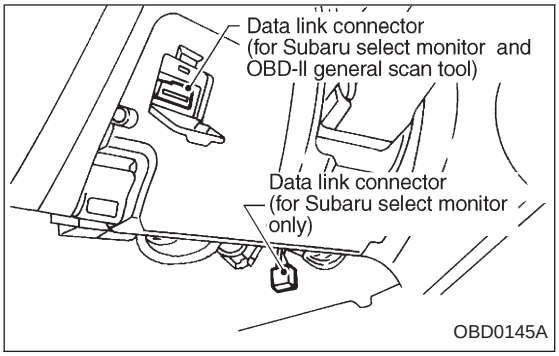
- Immediately at fault recognition

WIRING DIAGRAM:



B2M0916

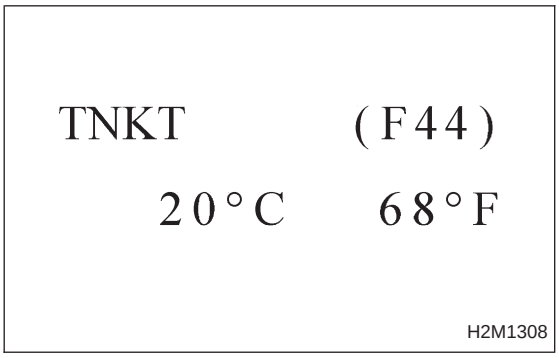
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



OBD0145A

10W1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
4) Start engine.



H2M1308

5) Read data on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor

Designate mode using function key.

Function mode: F44

- F44: Fuel temperature is indicated in "°C" and "°F".

CHECK ***: Is the value less than −40°C or −40°F in function mode F44?***

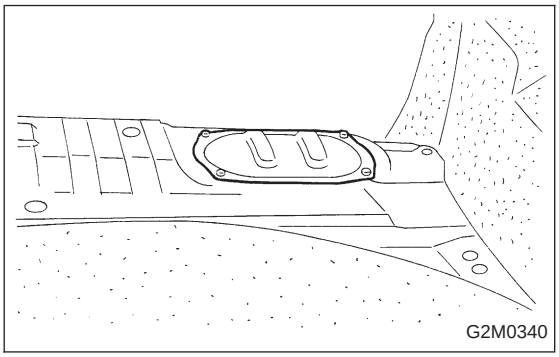
YES : Go to step **10W2**.

NO : Repair poor contact.

NOTE:
In this case, repair the following:

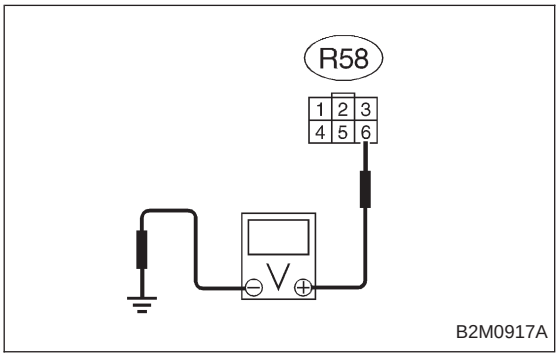
- Poor contact in fuel pump connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B22, B98 and R57)
- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.


G2M0340

10W2	CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Remove access hole lid.
3) Disconnect connector from fuel pump.



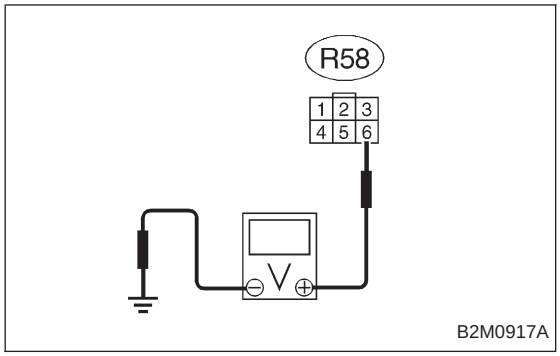
B2M0917A

4) Measure voltage between fuel pump connector and chassis ground.

CHECK ***: Connector & terminal (R58) No. 6 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and fuel pump connector.

NO : Go to next step 5).

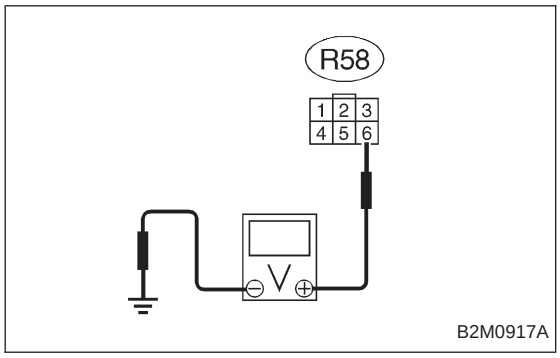


5) Turn ignition switch to ON.
6) Measure voltage between fuel pump connector and chassis ground.

CHECK : ***Connector & terminal (R58) No. 6 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and fuel pump connector.

NO : Go to step **10W3**.



10W3	**CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.**

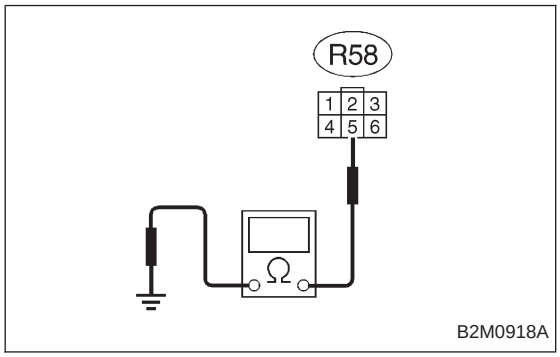
1) Measure voltage between fuel pump connector and chassis ground.

CHECK : ***Connector & terminal (R58) No. 6 (+) — Chassis ground (−): Is the voltage more than 4 V?***

YES : Go to next step 2).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and fuel pump connector
- Poor contact in fuel pump connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (B98 and R57)



2) Turn ignition switch to OFF.
3) Measure resistance of harness between fuel pump connector and chassis ground.

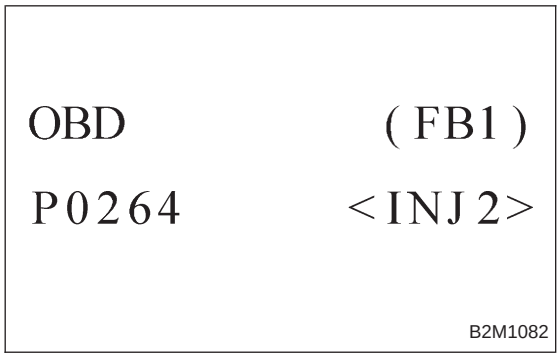
CHECK : ***Connector & terminal (R58) No. 5 — Chassis ground: Is the resistance less than 5 Ω?***

YES : Replace fuel temperature sensor.

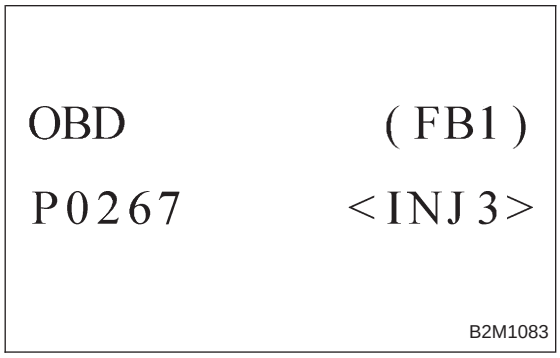
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and fuel pump connector
- Poor contact in fuel pump connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (B22, B98 and R57)

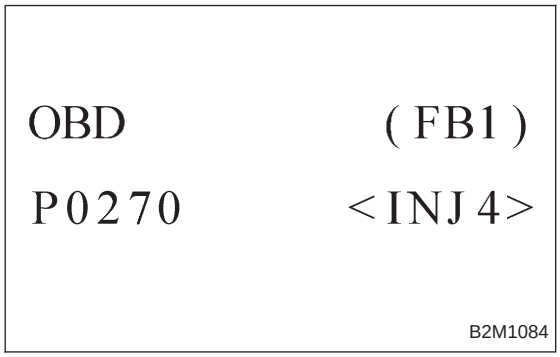
X: DTC P0261
— FUEL INJECTOR CIRCUIT LOW INPUT - #1 —



Y: DTC P0264
— FUEL INJECTOR CIRCUIT LOW INPUT - #2 —



Z: DTC P0267
— FUEL INJECTOR CIRCUIT LOW INPUT - #3 —



AA: DTC P0270
— FUEL INJECTOR CIRCUIT LOW INPUT - #4 —

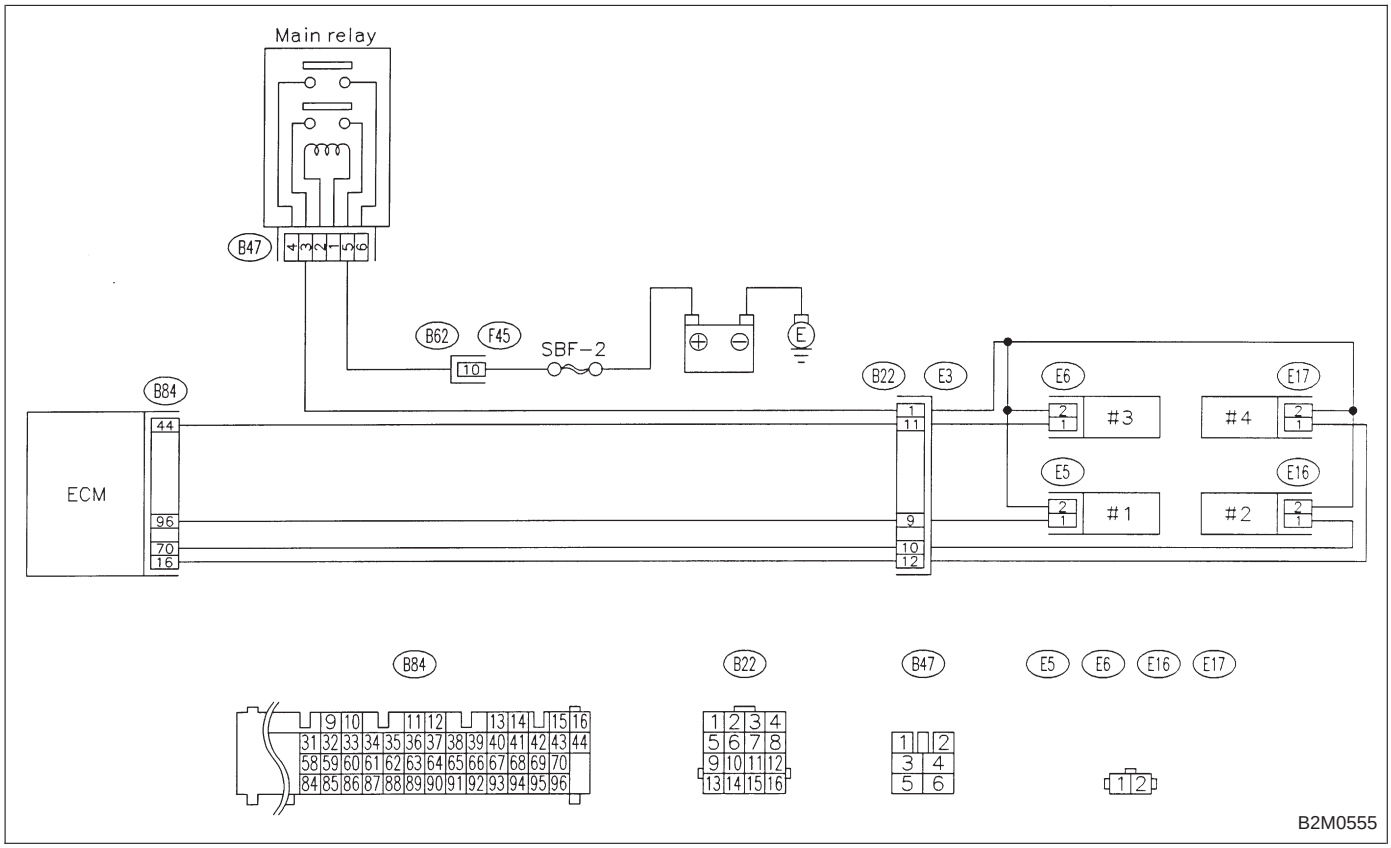
DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

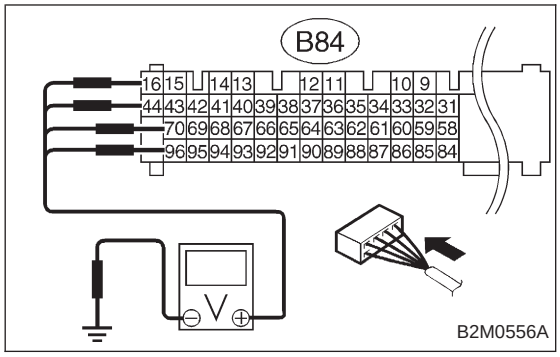
- Failure of engine to start
- Engine stalls.
- Erroneous idling
- Rough driving

WIRING DIAGRAM:



CAUTION:

- **Check or repair only faulty cylinders.**
- **After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES. <Ref. to 2-7 [T3D0] and [T3E0].>**



10AA1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM connector and chassis ground on faulty cylinders.

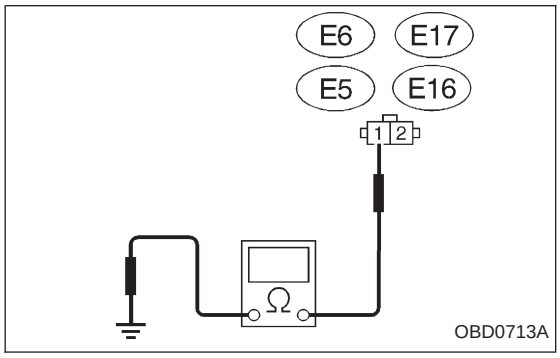
CHECK ***: Connector & terminal***
#1 (B84) No. 96 (+) — Chassis ground (−):
#2 (B84) No. 70 (+) — Chassis ground (−):
#3 (B84) No. 44 (+) — Chassis ground (−):
#4 (B84) No. 16 (+) — Chassis ground (−):
Is the voltage more than 10 V?

YES : Go to next CHECK .
NO : Go to step **10AA2**.

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.
NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

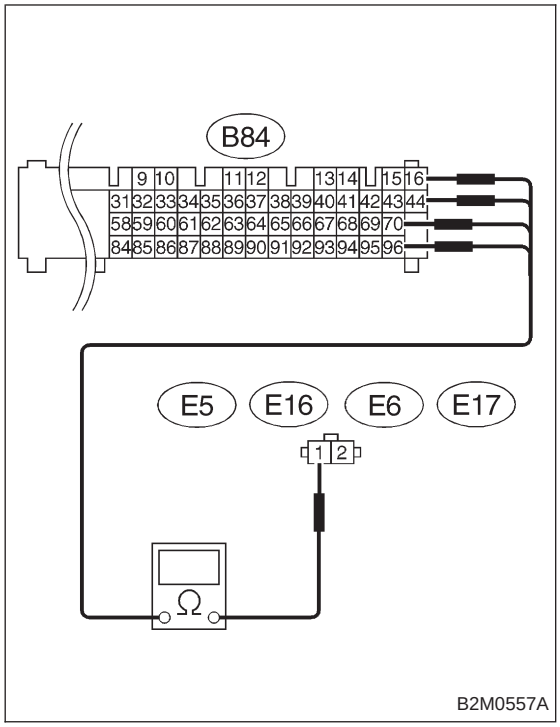


10AA2	CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from fuel injector on faulty cylinders.
3) Measure voltage between ECM connector and engine ground on faulty cylinders.

CHECK ***: Connector & terminal***
#1 (E5) No. 1 — Engine ground:
#2 (E16) No. 1 — Engine ground:
#3 (E6) No. 1 — Engine ground:
#4 (E17) No. 1 — Engine ground:
Is the resistance less than 10 Ω?

YES : Repair ground short circuit in harness between fuel injector and ECM connector.
NO : Go to next step 4).

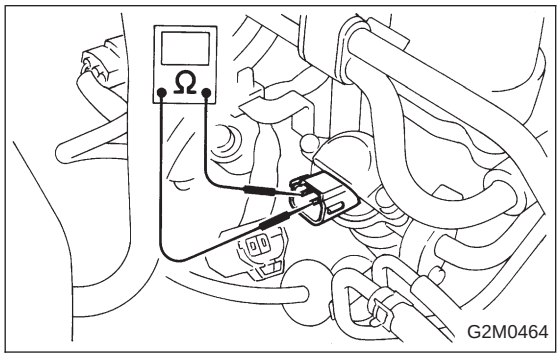


4) Measure resistance of harness connector between ECM connector and fuel injector on faulty cylinders.

CHECK ***: Connector & terminal***
#1 (B84) No. 96 — (E5) No. 1:
#2 (B84) No. 70 — (E16) No. 1:
#3 (B84) No. 44 — (E6) No. 1:
#4 (B84) No. 16 — (E17) No. 1:
Is the resistance less than 1 Ω?

YES : Go to step **10AA3**.

NO : Repair open circuit in harness between ECM and fuel injector connector.



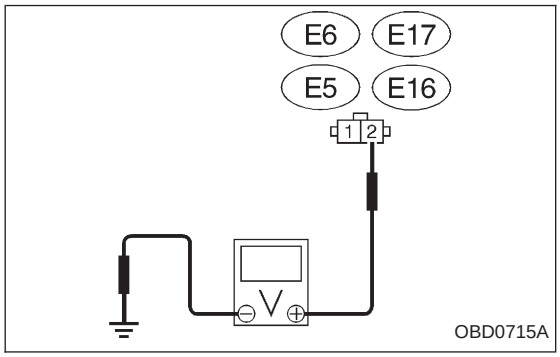
10AA3	CHECK FUEL INJECTOR.

Measure resistance between fuel injector terminals on faulty cylinder.

CHECK ***: Terminals***
No. 1 — No. 2:
Is the resistance between 5 and 20 Ω?

NO : Replace faulty fuel injector.

YES : Go to step **10AA4**.



10AA4	CHECK POWER SUPPLY LINE.

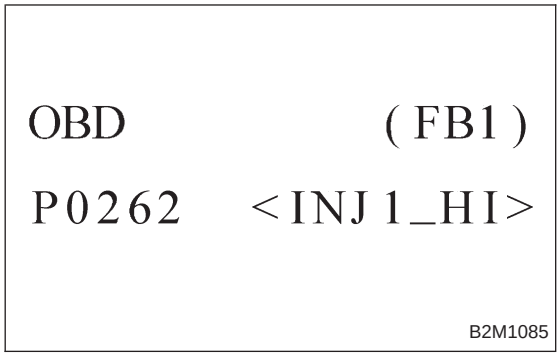
1) Turn ignition switch to ON.
2) Measure voltage between fuel injector and engine ground on faulty cylinders.

CHECK ***: Connector & terminal***
#1 (E5) No. 2 (+) — Engine ground (−):
#2 (E16) No. 2 (+) — Engine ground (−):
#3 (E6) No. 2 (+) — Engine ground (−):
#4 (E17) No. 2 (+) — Engine ground (−):
Is the voltage more than 10 V?

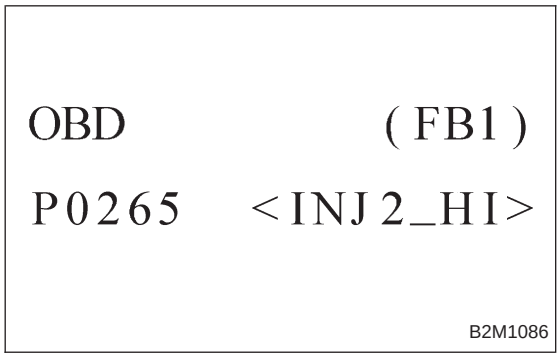
YES : Repair poor contact in all connectors in fuel injector circuit.

NO : Repair harness and connector.

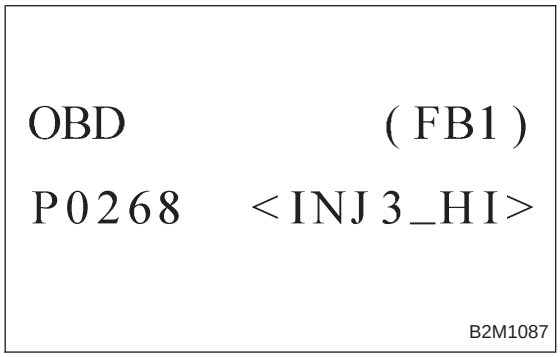
NOTE:
In this case, repair the following:
- Open circuit in harness between main relay and fuel injector connector on faulty cylinders
- Poor contact in main relay connector
- Poor contact in fuel injector connector on faulty cylinders



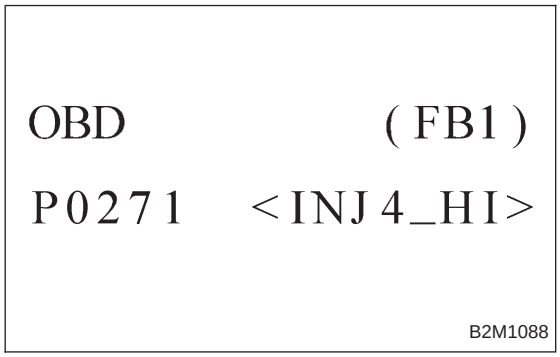
AB: DTC P0262
— FUEL INJECTOR CIRCUIT HIGH INPUT - #1 —



AC: DTC P0265
— FUEL INJECTOR CIRCUIT HIGH INPUT - #2 —



AD: DTC P0268
— FUEL INJECTOR CIRCUIT HIGH INPUT - #3 —



AE: DTC P0271
— FUEL INJECTOR CIRCUIT HIGH INPUT - #4 —

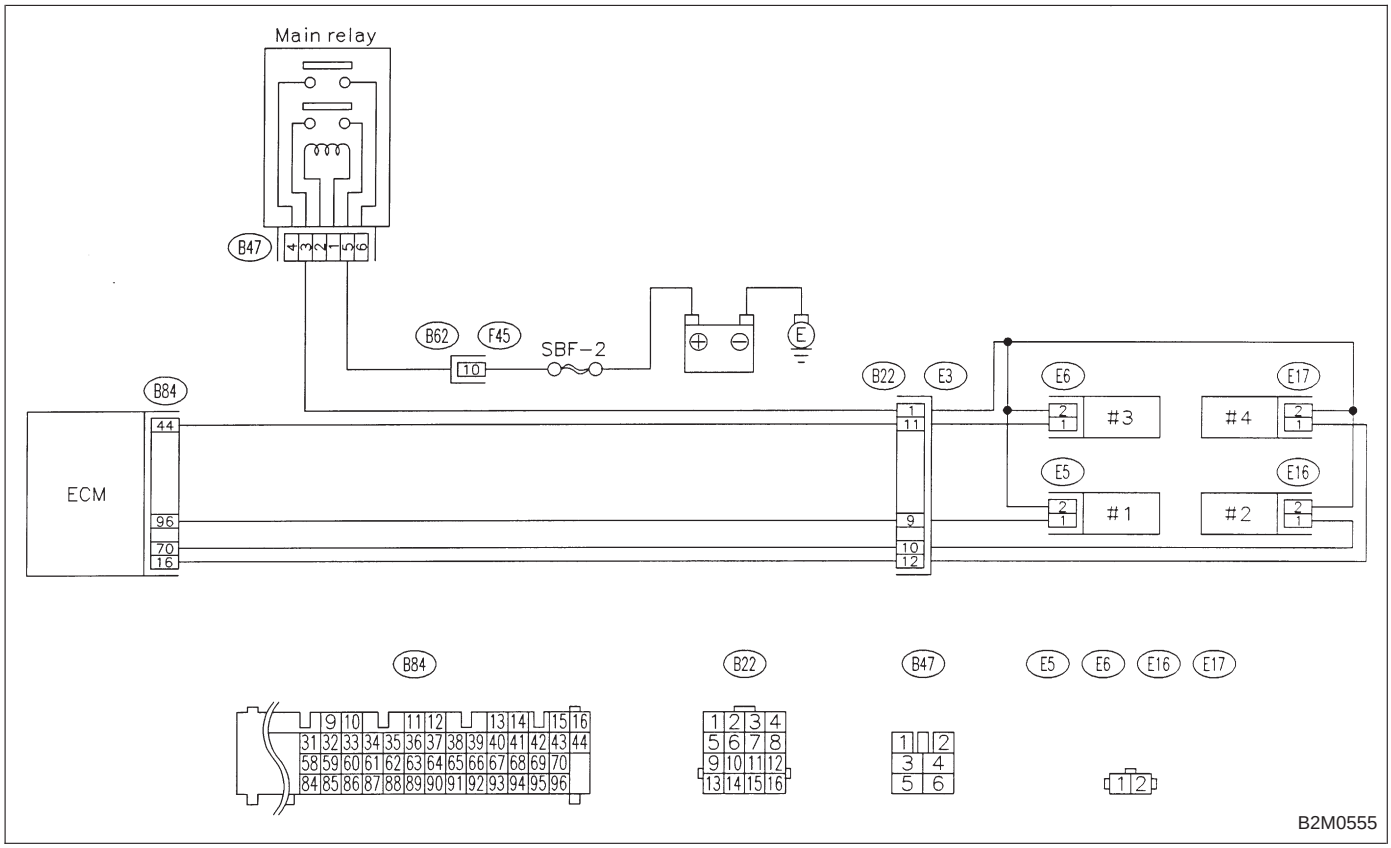
DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

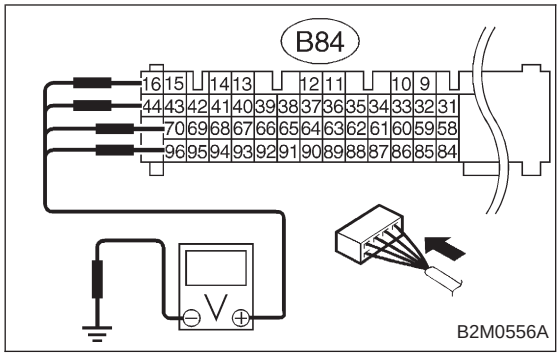
- Failure of engine to start
- Engine stalls.
- Erroneous idling
- Rough driving

WIRING DIAGRAM:



CAUTION:

- **Check or repair only faulty cylinders.**
- **After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES. <Ref. to 2-7 [T3D0] and [T3E0].>**



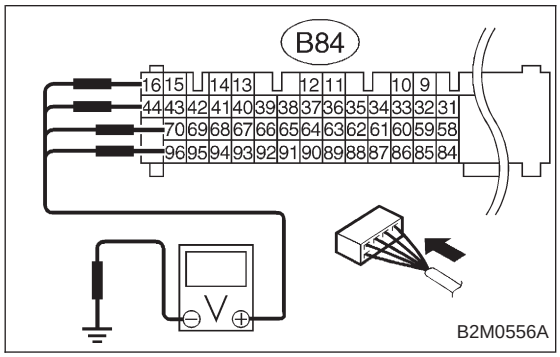
10AE1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM connector and chassis ground on faulty cylinders.

CHECK ***: Connector & terminal***
#1 (B84) No. 96 (+) — Chassis ground (−):
#2 (B84) No. 70 (+) — Chassis ground (−):
#3 (B84) No. 44 (+) — Chassis ground (−):
#4 (B84) No. 16 (+) — Chassis ground (−):
Is the voltage more than 10 V?

YES : Go to step **10AE2**.
NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***
YES : Repair poor contact in ECM connector.
NO : Replace ECM.

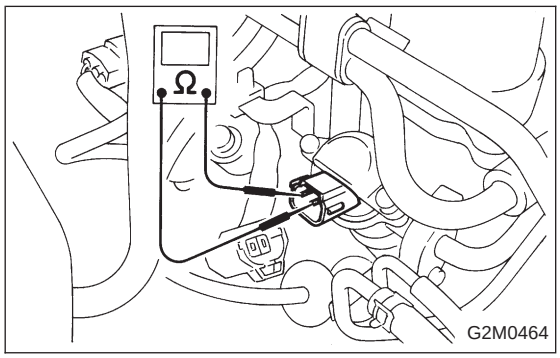


10AE2	CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from fuel injector on faulty cylinder.
3) Turn ignition switch to ON.
4) Measure voltage between ECM connector and chassis ground on faulty cylinders.

CHECK ***: Connector & terminal***
#1 (B84) No. 96 (+) — Chassis ground (−):
#2 (B84) No. 70 (+) — Chassis ground (−):
#3 (B84) No. 44 (+) — Chassis ground (−):
#4 (B84) No. 16 (+) — Chassis ground (−):
Is the voltage more than 10 V?

YES : Repair battery short circuit in harness between ECM and fuel injector. After repair, replace ECM.
NO : Go to next step 5).



5) Turn ignition switch to OFF.
6) Measure resistance between fuel injector terminals on faulty cylinder.

CHECK ***: Terminals***
No. 1 — No. 2 :
Is the resistance less than 1 Ω?

YES : Replace faulty fuel injector and ECM.
NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***
YES : Repair poor contact in ECM connector.
NO : Replace ECM.

AF: DTC P0301
— CYLINDER 1 MISFIRE DETECTED —

AG: DTC P0302
— CYLINDER 2 MISFIRE DETECTED —

AH: DTC P0303
— CYLINDER 3 MISFIRE DETECTED —

AI: DTC P0304
— CYLINDER 4 MISFIRE DETECTED —

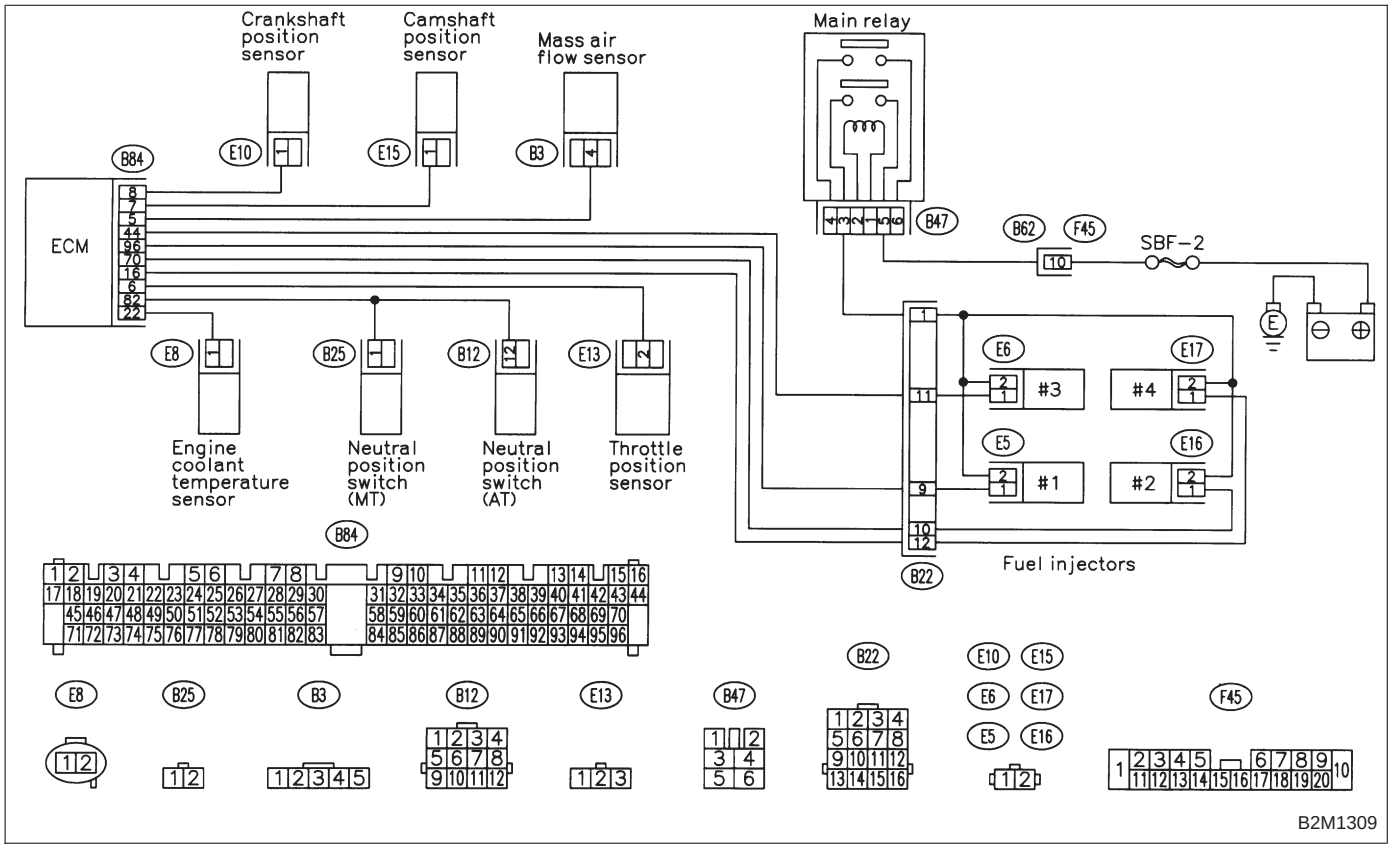
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)

TROUBLE SYMPTOM:

- Engine stalls.
- Erroneous idling
- Rough driving

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

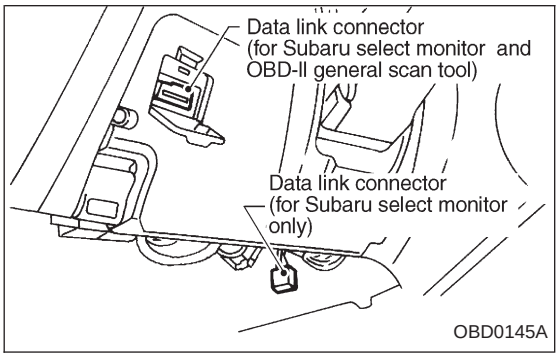
10AI1	**CHECK DTC P0101, P0102, P0103, P0116, P0117, P0125, P0261, P0262, P0264, P0265, P0267, P0268, P0270 OR P0271 ON DISPLAY.**

CHECK : ***Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0101, P0102, P0103, P0116, P0117, P0125, P0261, P0262, P0264, P0265, P0267, P0268, P0270 or P0271?***

YES : Inspect DTC P0101, P0102, P0103, P0116, P0117, P0125, P0261, P0262, P0264, P0265, P0267, P0268, P0270 or P0271 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

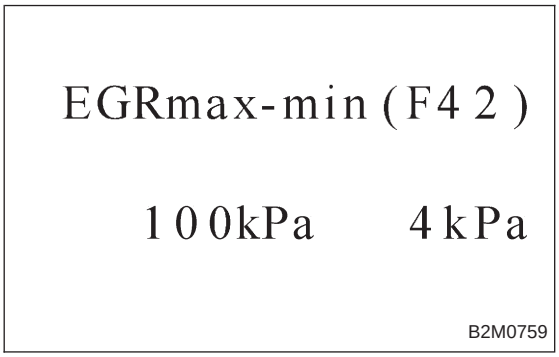
NOTE:
In this case, it is not necessary to inspect DTC P0301, P0302, P0303 and P0304.

NO : Go to step **10AI2**.



10AI2	**CONNECT SUBARU SELECT MONITOR AND READ DATA.**

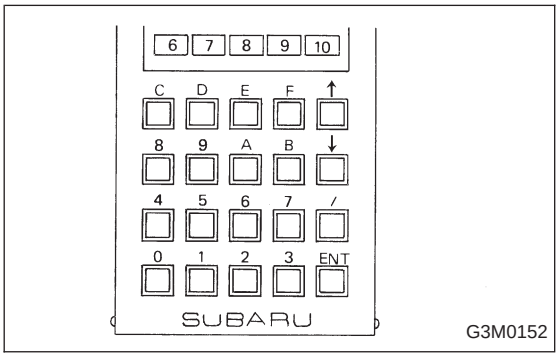
1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor to the data link connector.
3) Turn ignition switch to ON and turn Subaru Select Monitor switch to ON.



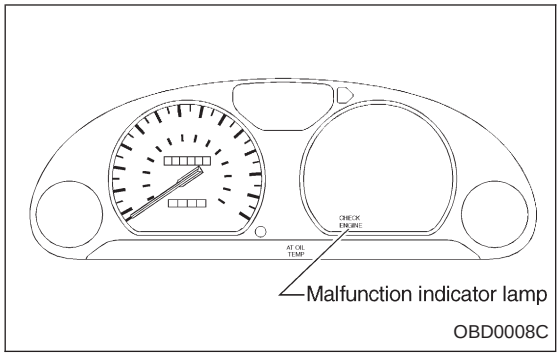
4) Read data on Subaru Select Monitor.
Designate mode use function key.

Function mode: F42

NOTE:
F42: Maximum and minimum EGR system pressure value are indicated at the same time.
5) Print out the displayed data on paper.



6) Clear memory on Subaru Select Monitor.
Designate mode use function key.
Press [F], [C], [0], [ENT] in that order.



7) Start engine, and drive the vehicle more than 10 minutes.

CHECK ***: Is the MIL coming on or blinking?***

YES : Go to step **10AI3**.

NO : Go to next CHECK .

CHECK ***: Has the vehicle been run empty of fuel?***

YES : Finish diagnostics operation, if the engine has no abnormality.

NO : Go to next CHECK .

CHECK ***: Was the cause of misfire diagnosed when the engine is running?***

NOTE:
Ex. Remove spark plug cord, etc.

YES : Finish diagnostics operation, if the engine has no abnormality.

NO : Repair connector.

NOTE:
In this case, repair the following:
- Poor contact in ignitor connector
- Poor contact in ignition coil connector
- Poor contact in fuel injector connector on faulty cylinders
- Poor contact in ECM connector
- Poor contact in coupling connector (B22)

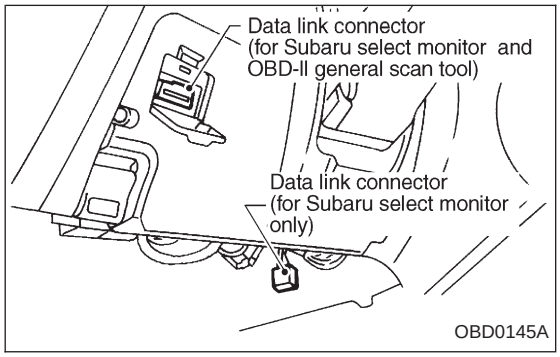
10AI3	CHECK AIR INTAKE SYSTEM.

CHECK ***: Is there a fault in air intake system?***

NOTE:
Check the following items:
- Are there air leaks or air suction caused by loose or dislocated nuts and bolts?
- Are there cracks or any disconnection of hoses?

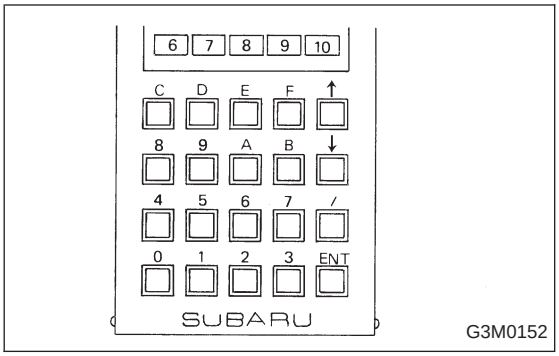
YES : Repair air intake system.

NO : Go to step **10AI4**.



10AI4	CHECK MISFIRE SYMPTOM.

1) Turn ignition switch to OFF.
2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON, and turn Subaru Select Monitor or OBD-II general scan tool switch to ON.



4) Read diagnostic trouble code (DTC).
● Subaru Select Monitor
Designate mode use function key.

Function mode: FB1

● OBD-II general scan tool
For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.

NOTE:
Perform diagnosis according to the items listed below.

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate only one DTC?***

YES : Go to step **10AI5**.

NO : Go to next CHECK .

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0301 and P0302?***

YES : Go to step **10AI6**.

NO : Go to next CHECK .

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0303 and P0304?***

YES : Go to step **10AI7**.

NO : Go to next CHECK .

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0301 and P0303?***

YES : Go to step **10AI8**.

NO : Go to next CHECK .

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0302 and P0304?***

YES : Go to step **10AI9**.

NO : Go to step **10AI10**.

10AI5	ONLY ONE CYLINDER

CHECK ***: Is there a fault in that cylinder?***

NOTE:
Check the following items.
- Spark plug
- Spark plug cord
- Fuel injector
- Compression ratio

YES : Repair or replace faulty parts.

NO : Go to step **10AI11**.

10AI6	GROUP OF #1 AND #2 CYLINDERS

CHECK ***: Are there faults in #1 and #2 cylinders?***

NOTE:
- Check the following items.
  - Spark plugs
  - Fuel injectors
  - Ignition coil
- If no abnormal is discovered, check for “D: IGNITION CONTROL SYSTEM” of #1 and #2 cylinders side. <Ref. to 2-7 [T8D0].>

YES : Repair or replace faulty parts.

NO : Go to step **10AI11**.

10AI7	GROUP OF #3 AND #4 CYLINDERS

CHECK ***: Are there faults in #3 and #4 cylinders?***

NOTE:

- Check the following items.
  - Spark plugs
  - Fuel injectors
  - Ignition coil
- If no abnormal is discovered, check for “D: IGNITION CONTROL SYSTEM” of #3 and #4 cylinders side. <Ref. to 2-7 [T8D0].>

YES : Repair or replace faulty parts.

NO : Go to step **10AI11**.

10AI8	GROUP OF #1 AND #3 CYLINDERS

CHECK ***: Are there faults in #1 and #3 cylinders?***

NOTE:

Check the following items.

- Spark plugs
- Fuel injectors
- Skipping timing belt teeth

YES : Repair or replace faulty parts.

NO : Go to step **10AI11**.

10AI9	GROUP OF #2 AND #4 CYLINDERS

CHECK ***: Are there faults in #2 and #4 cylinders?***

NOTE:
Check the following items.
- Spark plugs
- Fuel injectors
- Skipping timing belt teeth

YES : Repair or replace faulty parts.

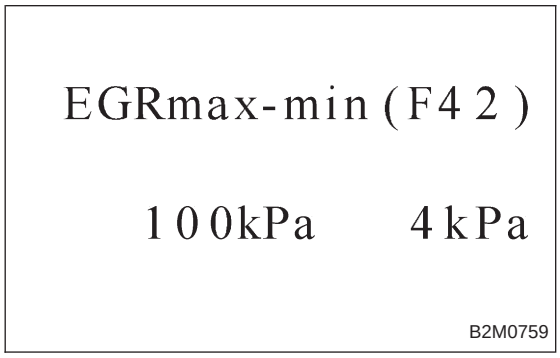
NO : Go to step **10AI11**.

10AI10	THE CYLINDER AT RANDOM

CHECK ***: Is the engine idle rough?***

YES : Go to step **10AI11**.

NO : Go to DTC P0170. <Ref. to 2-7 [T10T3], [T10T4] and [T10T5].>



10AI11	CHECK EGR SYSTEM.

CHECK ***: Is the minimum EGR system pressure value (value of function mode (F42) less than 1 kPa?***

NOTE:
Use the value read in step **10X2** for function mode F42.

YES : Clean EGR valve.

CAUTION:
Do not use solvent when cleaning EGR valve assembly, as it can damage diaphragm.

NOTE:
- Remove and blow away the exhaust deposits. Make sure the valve operates smoothly and the valve seat area is completely cleaned.
- Replace EGR valve as required.

NO : Go to DTC P0170. <Ref. to 2-7 [T10T3], [T10T4] and [T10T5].>

OBD (FB1)

P0325 <KNOCK>

OBD0283

AJ: DTC P0325 — KNOCK SENSOR CIRCUIT MALFUNCTION —

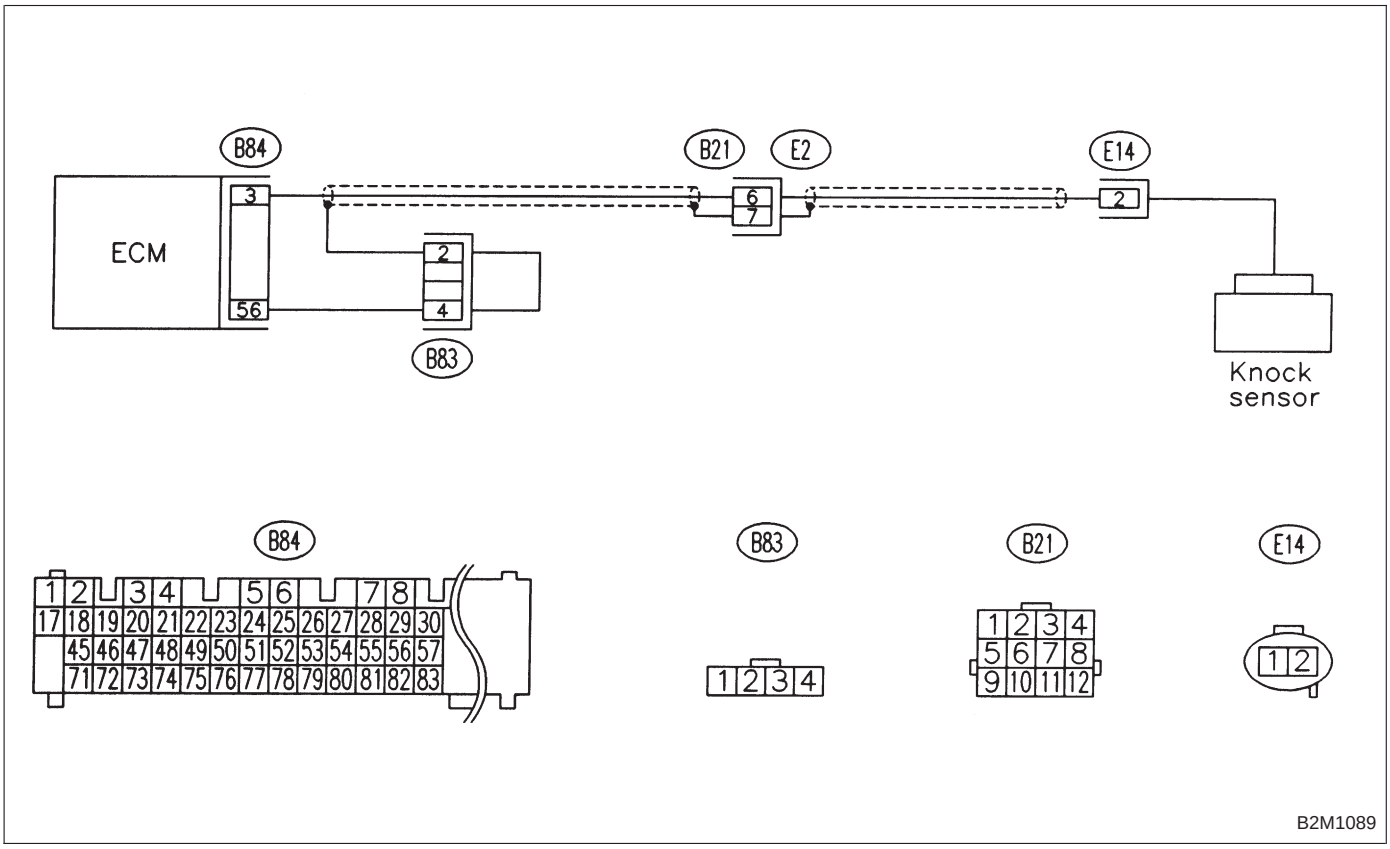
DTC DETECTING CONDITION:

- Immediately at fault recognition

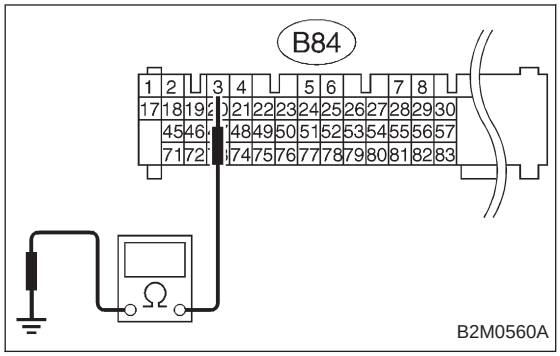
TROUBLE SYMPTOM:

- Poor driving performance
- Knocking occurs.

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

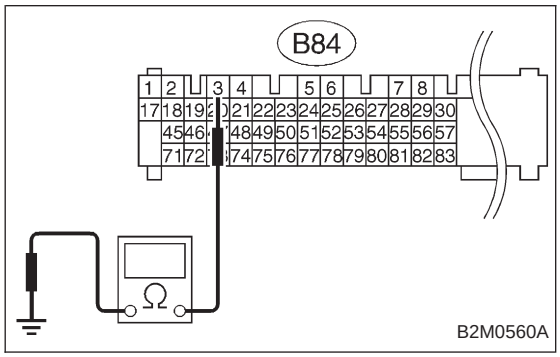


10AJ1	CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from ECM.
3) Measure resistance between ECM harness connector and chassis ground.

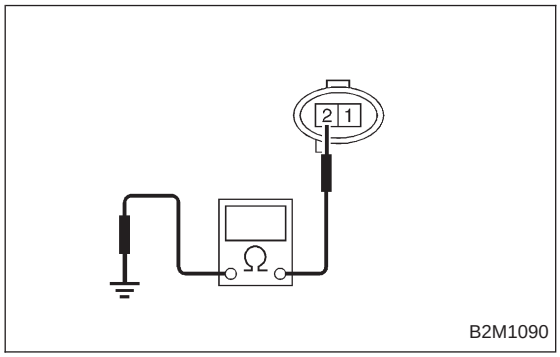
CHECK : ***Connector & terminal***
(B84) No. 3 — Chassis ground:
Is the resistance more than 700 kΩ?

YES : Go to step **10AJ2**.
NO : Go to next CHECK .



CHECK : ***Connector & terminal***
(B84) No. 3 — Chassis ground:
Is the resistance less than 400 kΩ?

YES : Go to step **10AJ3**.
NO : Go to step **10AJ4**.



10AJ2	CHECK KNOCK SENSOR.

1) Disconnect connector from knock sensor.
2) Measure resistance between knock sensor connector terminal and engine ground.

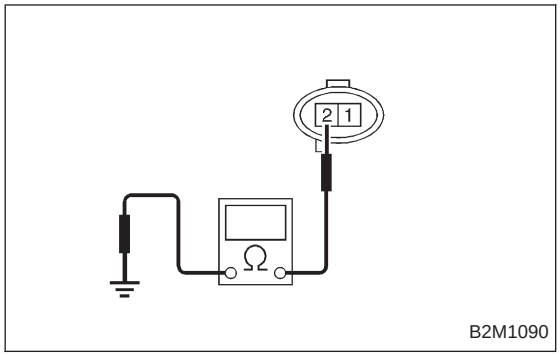
CHECK : ***Terminal***
No. 2 — Engine ground:
Is the resistance more than 700 kΩ?

YES : Go to next CHECK .
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between knock sensor and ECM connector
- Poor contact in knock sensor connector
- Poor contact in coupling connector (B21)

CHECK : ***Is the knock sensor installation bolt tightened securely?***

YES : Replace knock sensor.
NO : Tighten knock sensor installation bolt securely.



10AJ3	CHECK KNOCK SENSOR.

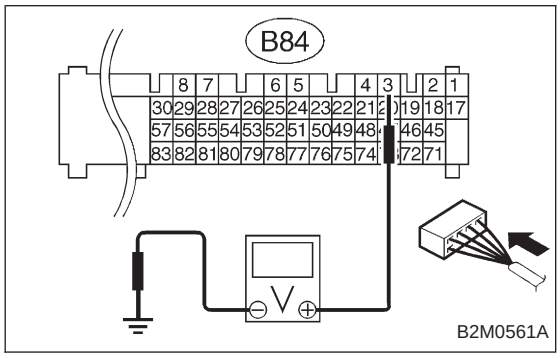
1) Disconnect connector from knock sensor.
2) Measure resistance between knock sensor connector terminal and engine ground.

CHECK ***: Terminal***
No. 2 — Engine ground:
Is the resistance less than 400 kΩ?

YES : Replace knock sensor.

NO : Repair ground short circuit in harness between knock sensor connector and ECM connector.

NOTE:
The harness between both connectors is shielded. Repair short circuit of harness together with shield.



10AJ4	CHECK INPUT SIGNAL FOR ECM.

1) Connect connectors to ECM and knock sensor.
2) Turn ignition switch to ON.
3) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal***
(B84) No. 3 (+) — Chassis ground (−):
Is the voltage more than 2 V?

YES : Even if MIL lights up, the circuit has returned to a normal condition at this time. (However, the possibility of poor contact still remains.)

NOTE:
In this case, repair the following:
- Poor contact in knock sensor connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B21)

NO : Repair poor contact in ECM connector.

OBD (FB1)

P0335 <CRANK>

OBD0292

AK: DTC P0335 — CRANKSHAFT POSITION SENSOR CIRCUIT MALFUNCTION —

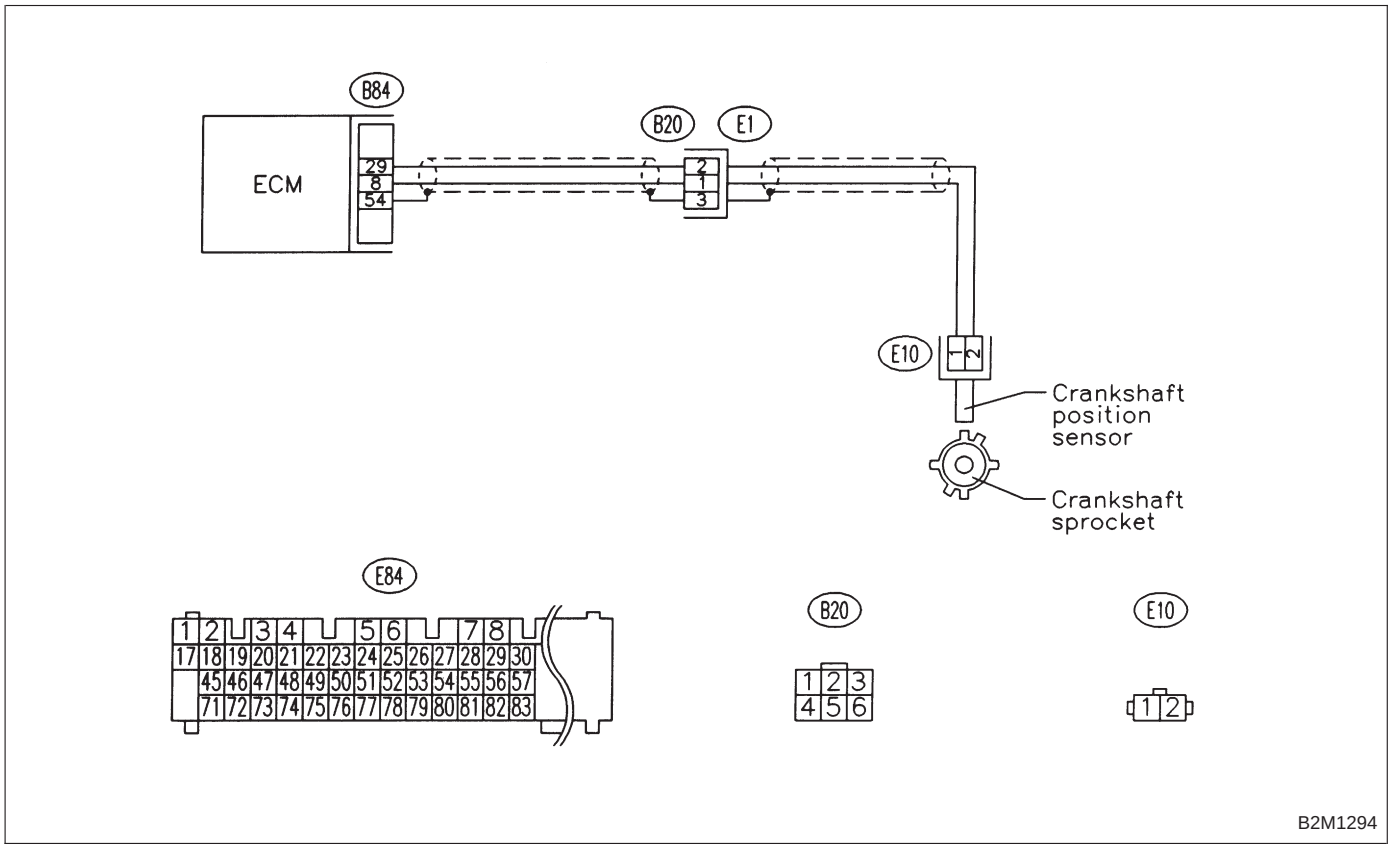
DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

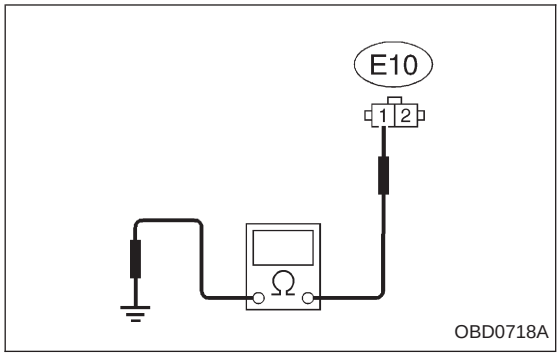
- Engine stalls.
- Failure of engine to start

WIRING DIAGRAM:



B2M1294

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10AK1	CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.

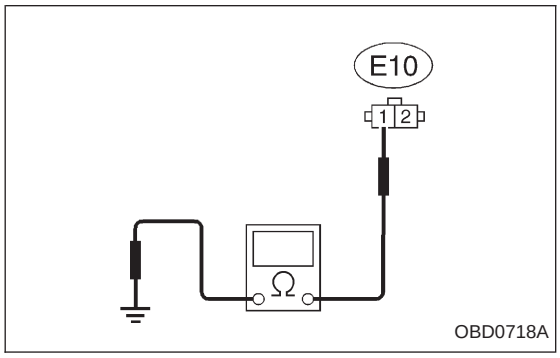
1) Turn ignition switch to OFF.
2) Disconnect connector from crankshaft position sensor.
3) Measure resistance of harness between crankshaft position sensor connector and engine ground.

CHECK ***: Connector & terminal***
(E10) No. 1 — Engine ground:
Is the resistance more than 100 kΩ?

YES : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between crankshaft position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B20)

NO : Go to next CHECK .

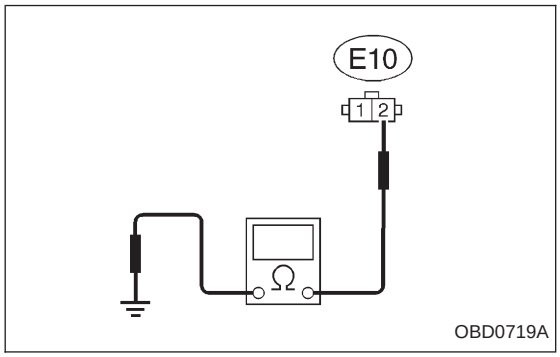


CHECK ***: Connector & terminal***
(E10) No. 1 — Engine ground:
Is the resistance less than 10 Ω?

YES : Repair ground short circuit in harness between crankshaft position sensor and ECM connector.

NOTE:
The harness between both connectors are shielded. Repair ground short circuit in harness together with shield.

NO : Go to next CHECK .



CHECK ***: Connector & terminal***
(E10) No. 2 — Engine ground:
Is the resistance less than 5 Ω?

YES : Go to step **10AK2**.

NO : Repair harness and connector.

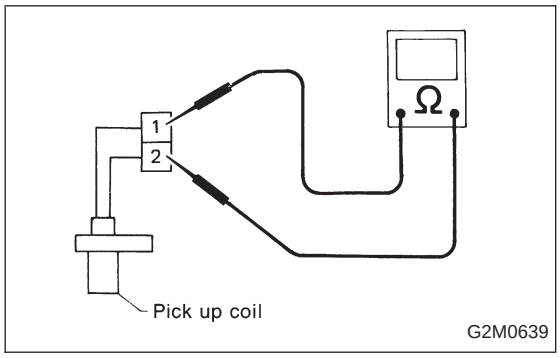
NOTE:
In this case, repair the following:
- Open circuit in harness between crankshaft position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B20)

10AK2	CHECK CRANKSHAFT POSITION SENSOR.

CHECK ***: Is the crankshaft position sensor installation bolt tightened securely?***

YES : Go to next step 1).

NO : Tighten crankshaft position sensor installation bolt securely.



1) Remove crankshaft position sensor.
2) Measure resistance between connector terminals of crankshaft position sensor.

CHECK ***: Terminals***
No. 1 — No. 2:
Is the resistance between 1 and 4 kΩ?

YES : Repair poor contact in crankshaft position sensor connector.

NO : Replace crankshaft position sensor.

OBD (FB1)

P0336 <CRANK_R>

B2M1091

AL: DTC P0336 — CRANKSHAFT POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —

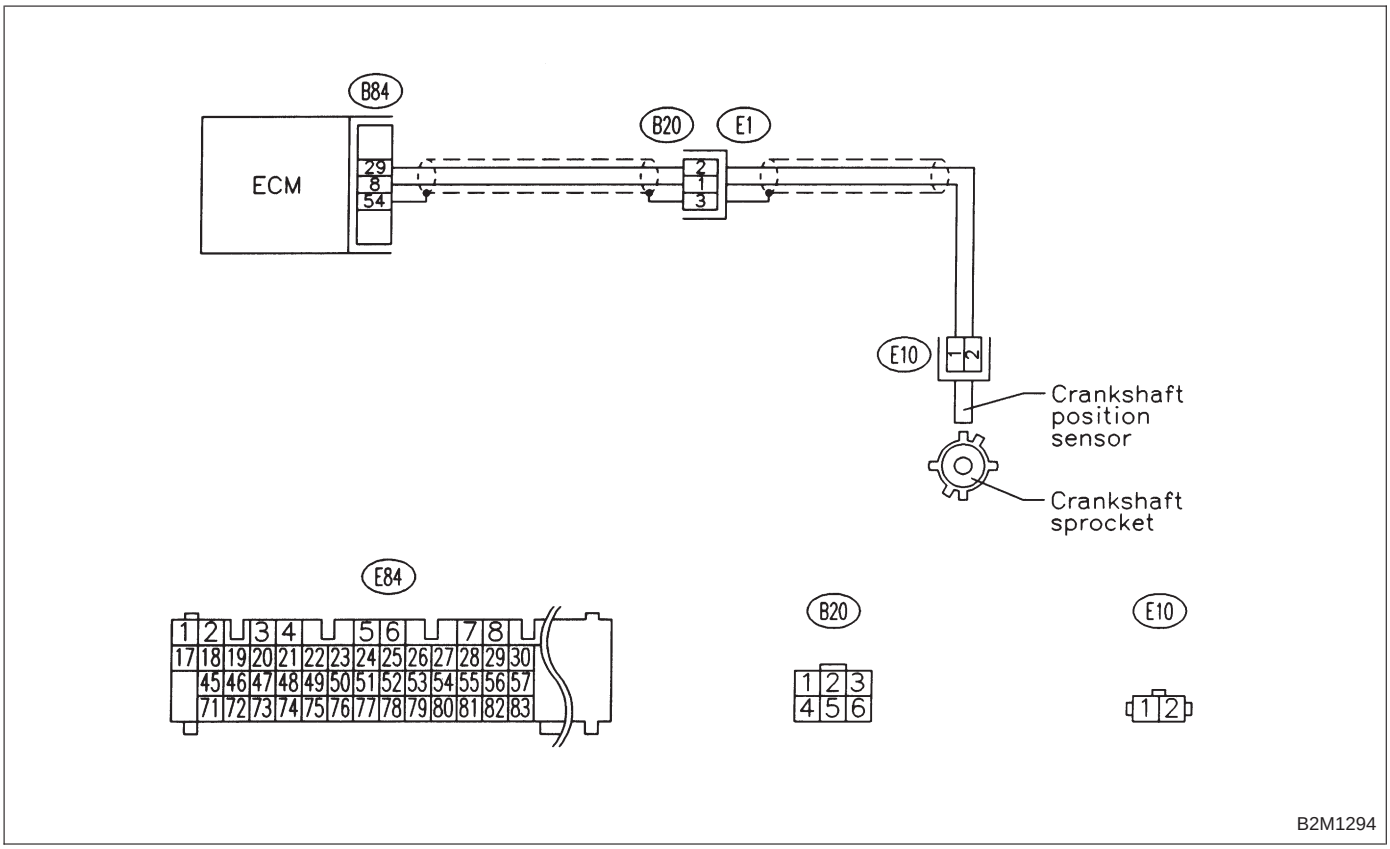
DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

WIRING DIAGRAM:



B2M1294

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10AL1	CHECK DTC P0335 ON DISPLAY.

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0335?***

YES : Inspect DTC P0335 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NO : Replace crankshaft position sensor.

OBD	(FB1)
P0340	<CAM>

OBD0304

AM: DTC P0340 — CAMSHAFT POSITION SENSOR CIRCUIT MALFUNCTION —

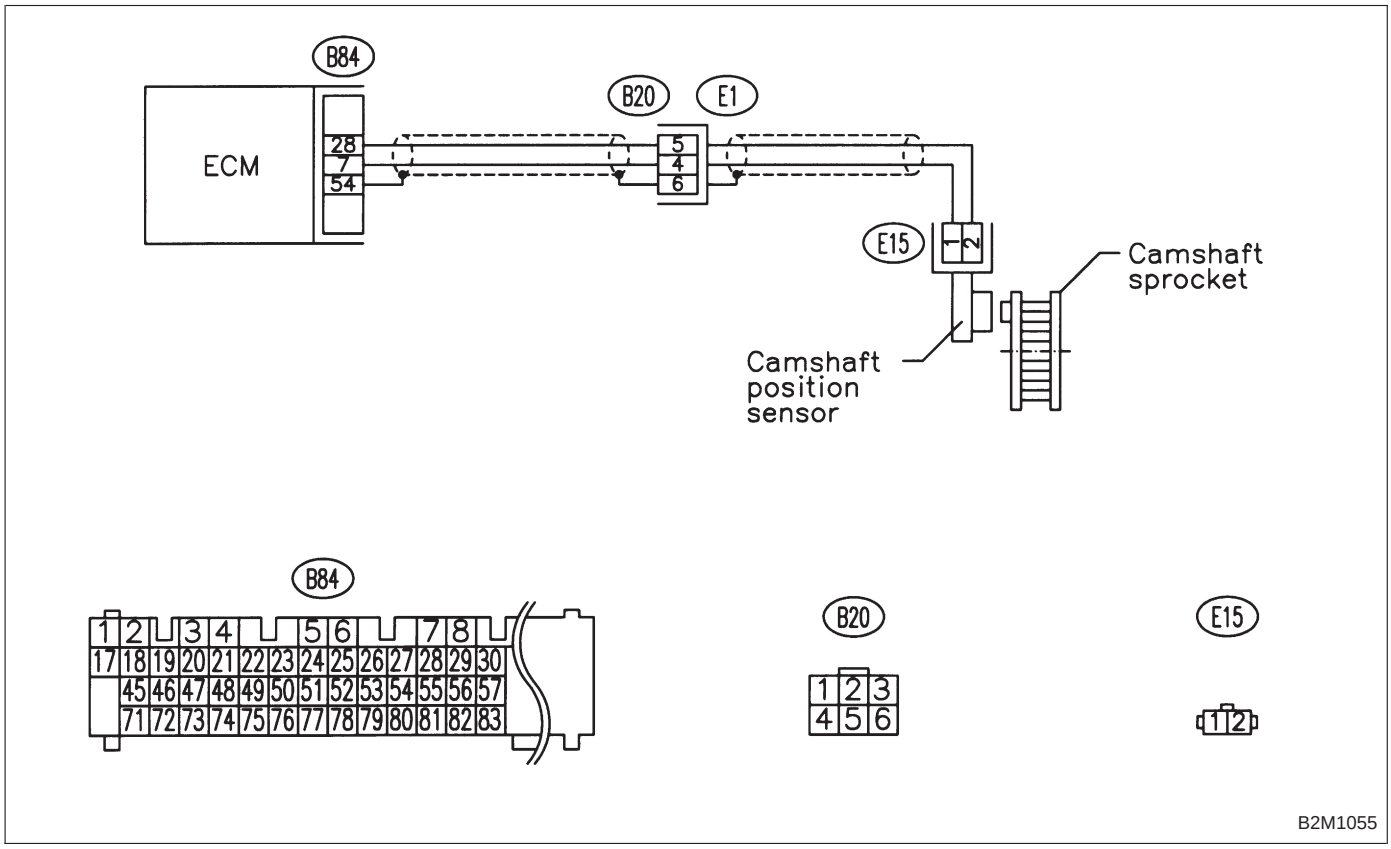
DTC DETECTING CONDITION:

- Immediately at fault recognition

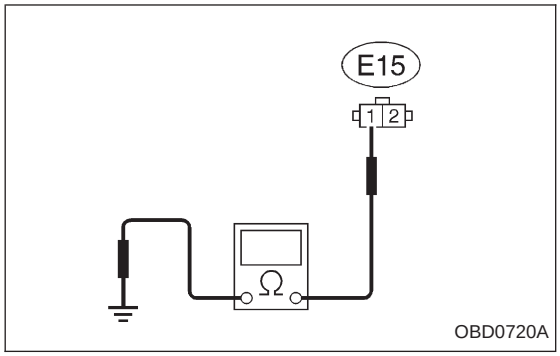
TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10AM1	CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR.

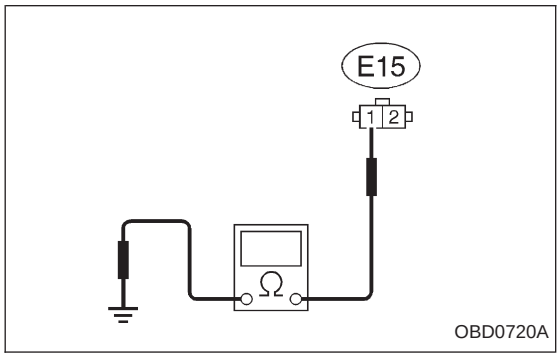
1) Turn ignition switch to OFF.
2) Disconnect connector from camshaft position sensor.
3) Measure resistance of harness between camshaft position sensor connector and engine ground.

CHECK ***: Connector & terminal (E15) No. 1 — Engine ground: Is the resistance more than 100 kΩ?***

YES : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between camshaft position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B20)

NO : Go to next CHECK .

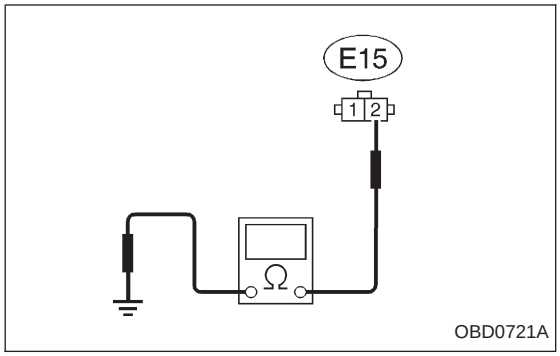


CHECK ***: Connector & terminal (E15) No. 1 — Engine ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between camshaft position sensor connector and ECM connector.

NOTE:
The harness between both connectors are shielded. Repair ground short circuit in harness together with shield.

NO : Go to next CHECK .



CHECK ***: Connector & terminal***
(E15) No. 2 — Engine ground:
Is the resistance less than 5 Ω?

YES : Go to step **10AM2**.

NO : Repair harness and connector.

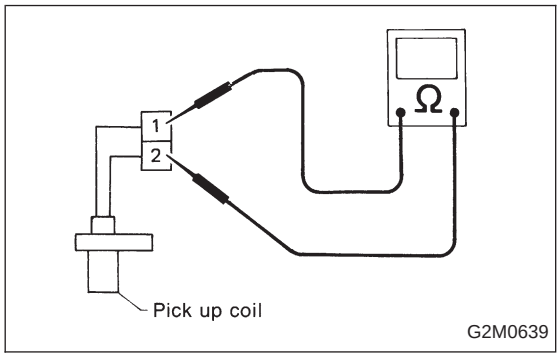
NOTE:
In this case, repair the following:
- Open circuit in harness between camshaft position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B20)

10AM2	CHECK CAMSHAFT POSITION SENSOR.

CHECK ***: Is the camshaft position sensor installation bolt tightened securely?***

YES : Go to next step 1).

NO : Tighten camshaft position sensor installation bolt securely.



1) Remove camshaft position sensor.
2) Measure resistance between connector terminals of camshaft position sensor.

CHECK ***: Terminals***
No. 1 — No. 2:
Is the resistance between 1 and 4 kΩ?

YES : Repair poor contact in camshaft position sensor connector.

NO : Replace camshaft position sensor.

OBD (FB1)
P0341 <CAM_R>
B2M1092

AN: DTC P0341 — CAMSHAFT POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —

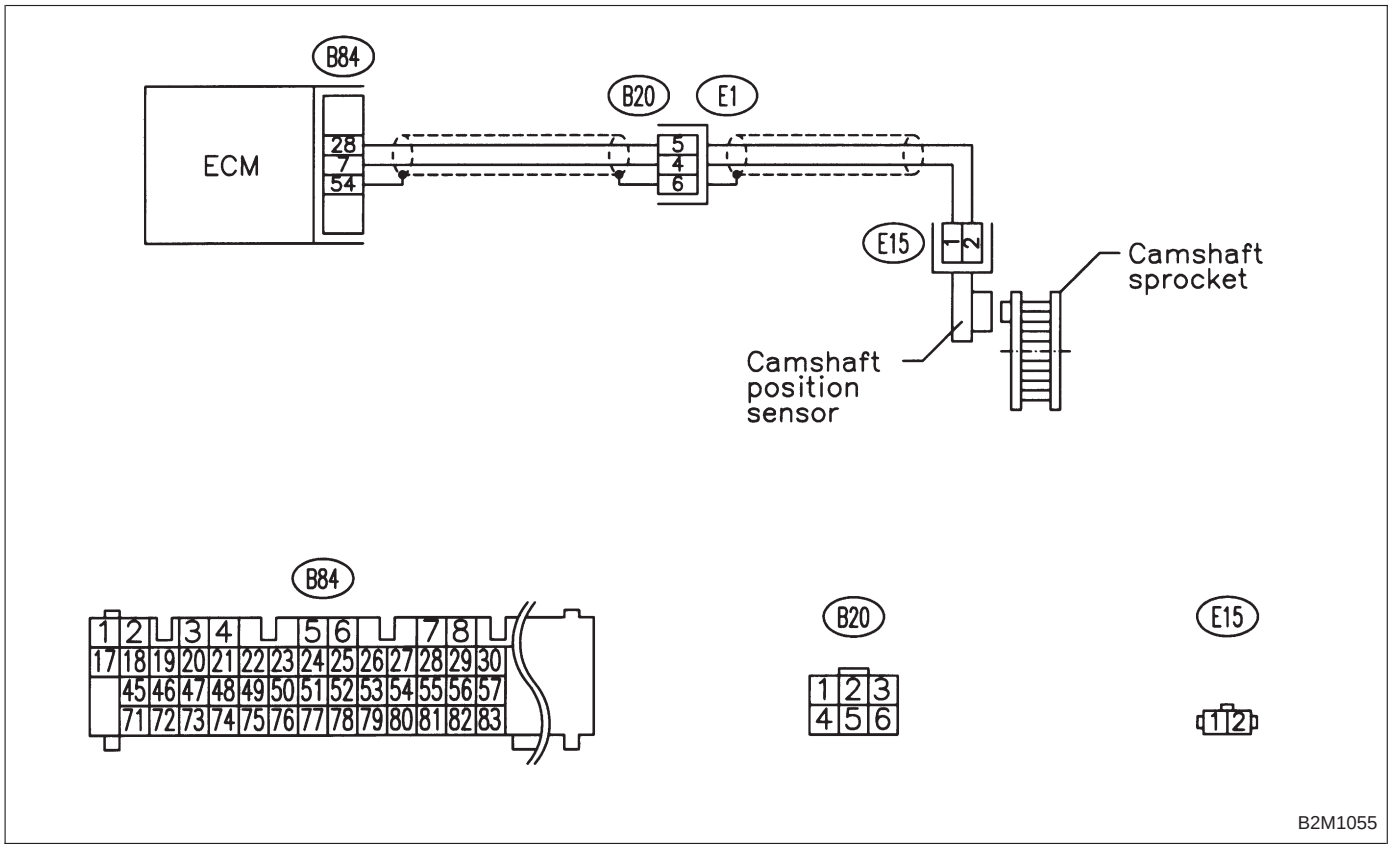
DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10AN1	CHECK DTC P0340 ON DISPLAY.

CHECK : ***Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0340?***

YES : Inspect DTC P0340 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NO : Replace camshaft position sensor.

OBD (FB1)

P0400 <EGR>

OBD0315

AO: DTC P0400 — EXHAUST GAS RECIRCULATION FLOW MALFUNCTION —

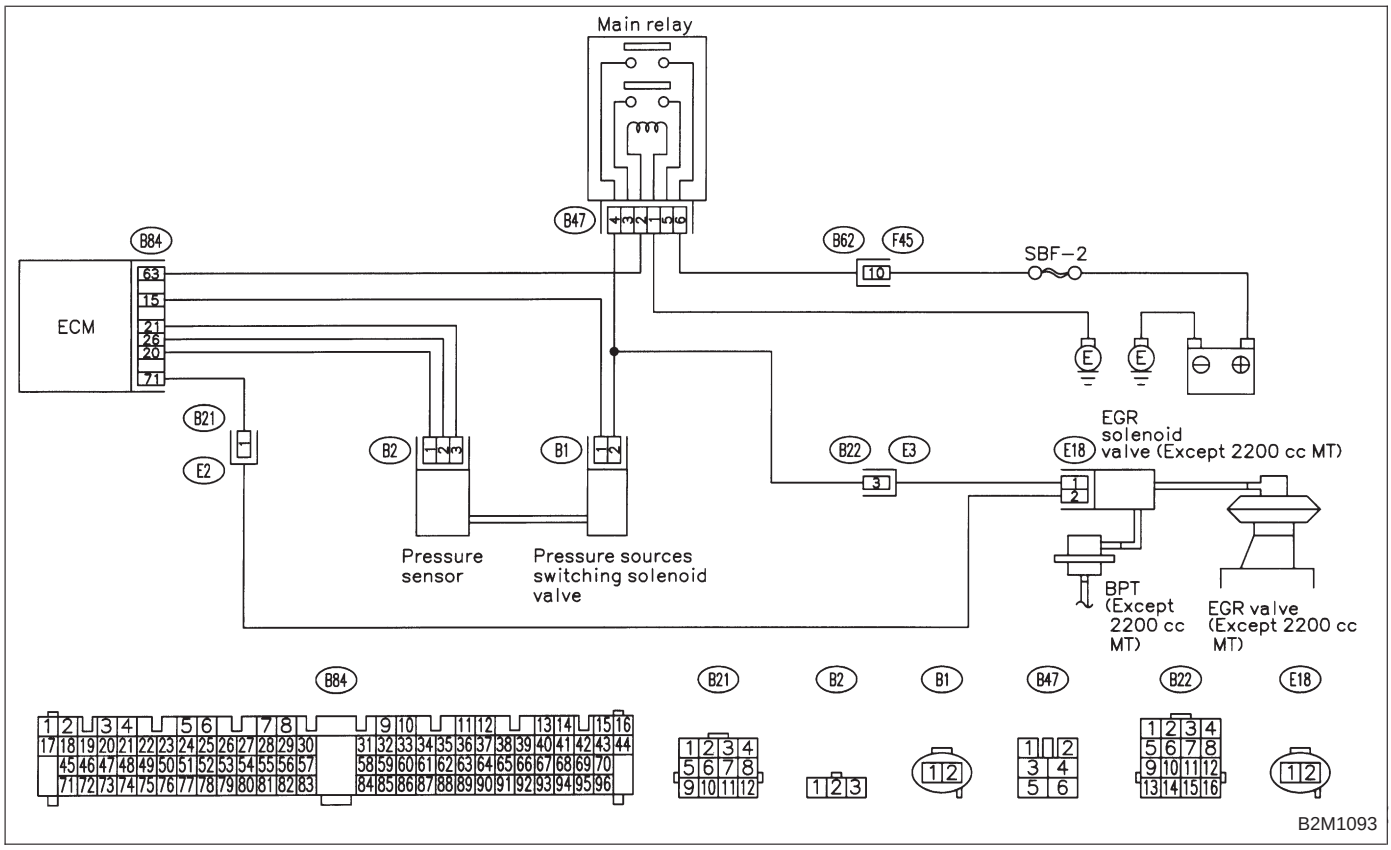
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Poor driving performance on low engine speed

WIRING DIAGRAM:



CAUTION:

Before confirmation of actual driving pattern, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10AO1	CHECK ENGINE/TRANSMISSION TYPE.

CHECK ***: Is engine/transmission type 2200 cc/MT?***

YES : Check AT/MT identification circuit. <Ref. to 2-7 [T10DD0].>

NO : Go to step **10AO2**.

10AO2	CHECK DTC P0106, P0107, P0108, P0403, P1102, P1122 OR P1421 ON DISPLAY.

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0106, P0107, P0108, P0403, P1102, P1122 or P1421?***

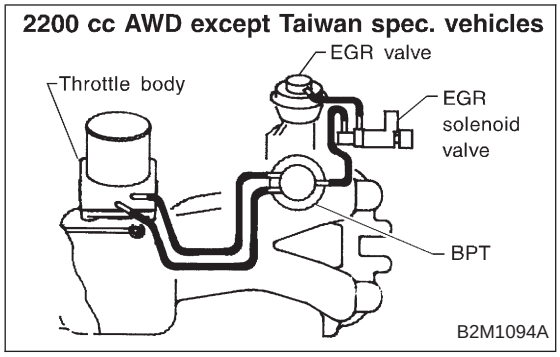
YES : ● Inspect DTC P0106, P0107, P0108, P0403, P1102, P1122 or P1421 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>
● Manually check that EGR valve diaphragm is not stuck.

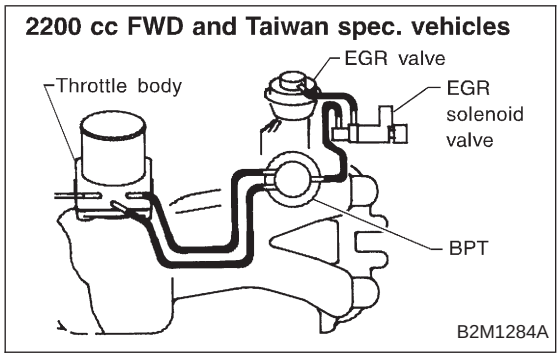
WARNING:
Be careful when checking EGR valve, since it may be extremely hot.

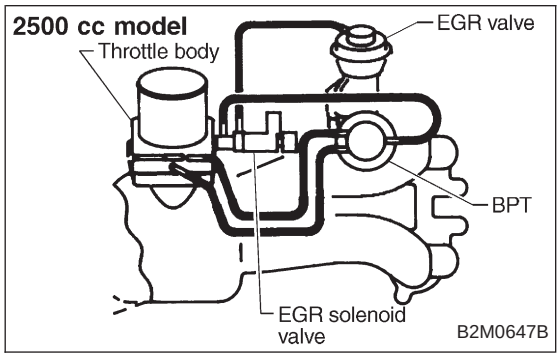
NOTE:
In this case, it is not necessary to inspect DTC P0400.

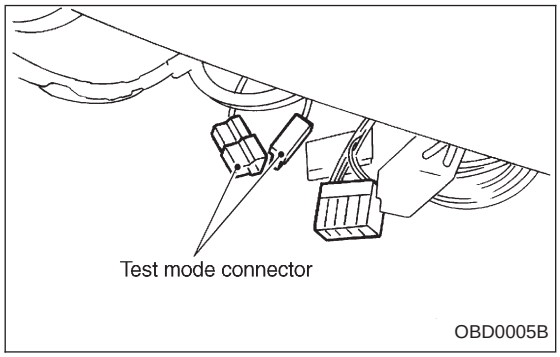
After checking the above item, go to **CONFIRMATION OF ACTUAL DRIVING PATTERN.**

NO : Go to step **10AO3**.









10AO3	CHECK VACUUM LINE.

CHECK ***: Is there a fault in vacuum line?***

NOTE:
Check the following items.
- Disconnection, leakage and clogging of the two vacuum hoses and pipes between throttle body and BPT
- Disconnection, leakage and clogging of the vacuum hose and pipe between EGR solenoid valve and BPT
- Disconnection, leakage and clogging of the vacuum hose between EGR solenoid valve and EGR valve
- Disconnection, leakage and clogging of BPT pressure transmitting hose

YES : Repair or replace hoses and pipes.
And after the checking and repairing, go to **CONFIRMATION OF ACTUAL DRIVING PATTERN**.

NO : Go to step **10AO4**.

10AO4	CHECK OPERATION OF EGR SYSTEM.

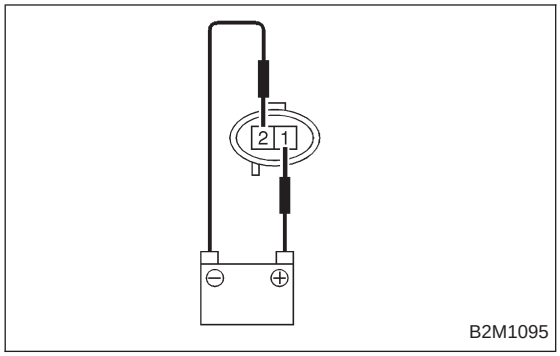
1) Turn ignition switch to OFF.
2) Connect the test mode connector.
3) Turn ignition switch to ON.

CHECK ***: Does EGR solenoid valve produce operating sound?***

NOTE:
EGR control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD05). For the procedure, refer to “COMPULSORY VALVE OPERATION CHECK MODE”. <Ref. to 2-7 [T3F0].>

YES : Go to next step 4).

NO : Replace EGR solenoid valve.



4) Turn ignition switch to OFF.
5) Disconnect connector from EGR solenoid valve.
6) Connect 12 V battery's ground ⊖ terminal to one terminal of the EGR solenoid valve. Then connect 12 V battery's ⊕ terminal to the other terminal of it.

CAUTION:
Do not use the 12 V battery installed in the vehicle, because the electrical system may be damaged.

7) Start the engine.

CHECK ***: Does EGR valve operate at a throttle valve opening of 5 to 10 degrees with visually check?***

YES : Possibly EGR valve malfunction may be due to freezing or clogging by foreign matter. At this point in time do not replace EGR valve, since it is not faulty. And after the checking, go to **CONFIRMATION OF ACTUAL DRIVING PATTERN.**

NOTE:
If malfunction is detected again in the confirmation of actual driving pattern, EGR valve is faulty. Go to next step 8).

NO : Go to next step 8).

8) Turn ignition switch to OFF.

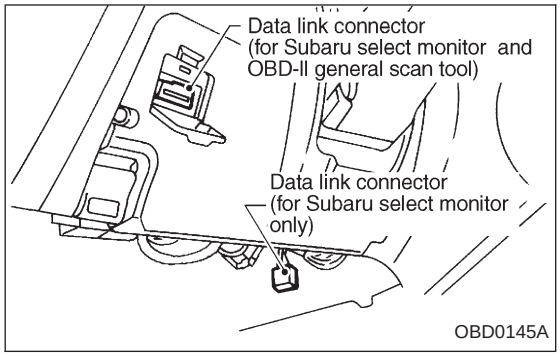
CHECK ***: Is there clogging in the gas outlets of intake manifold or cylinder head, checking by breathing into the outlets?***

YES : Repair or replace intake manifold or cylinder head. And go to **CONFIRMATION OF ACTUAL DRIVING PATTERN.**

NO : Clean EGR valve. And go to **CONFIRMATION OF ACTUAL DRIVING PATTERN.**

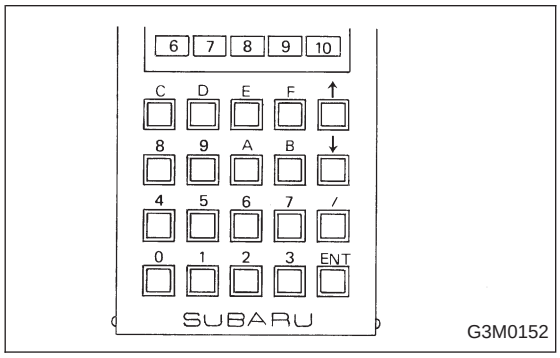
CAUTION:
Do not use solvent when cleaning EGR valve assembly, as it can damage diaphragm.

NOTE:
- Remove and blow away the exhaust deposits. Make sure the valve operates smoothly and the valve seat area is completely cleaned.
- Replace EGR valve as required.

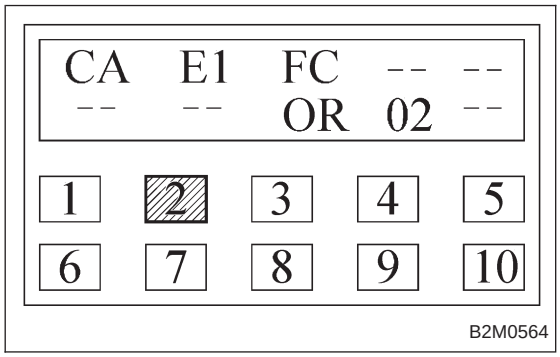


CONFIRMATION OF ACTUAL DRIVING PATTERN.

1) Conduct CLEAR MEMORY and INSPECTION MODES. <Ref. to 2-7 [T3D0] and [T3E0].>
2) Connect Subaru select monitor to its data link connector.
3) Start and warm-up the engine until the radiator fan makes one complete rotation. (All accessory switches are OFF.)
4) Turn Subaru select monitor switch to ON.

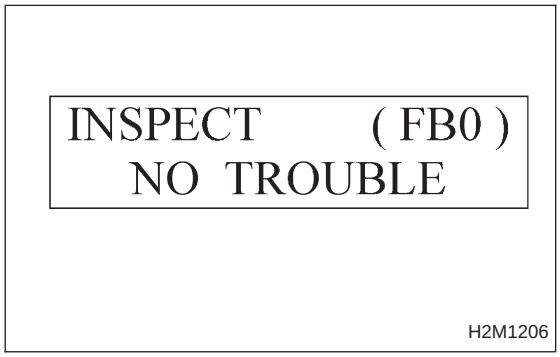


5) Designate mode using function key.
Function mode: FA4



6) Drive at 88±5 km/h (55±3 MPH) until the LED No. 2 comes on.

NOTE:
Keep the throttle valve opening at the same degree, since diagnosis will be interrupted when the opening varies.
Diagnosis starts in 190 seconds after starting engine and takes 4 seconds.
Put the gear to “D” range for the diagnosis.



7) Designate mode using function key.
Function mode: FB0
8) Confirm the “No trouble” indication on Subaru select monitor.

OBD	(FB1)
P0403	<EGRSOL>

OBD0323

AP: DTC P0403 — EXHAUST GAS RECIRCULATION CIRCUIT LOW INPUT —

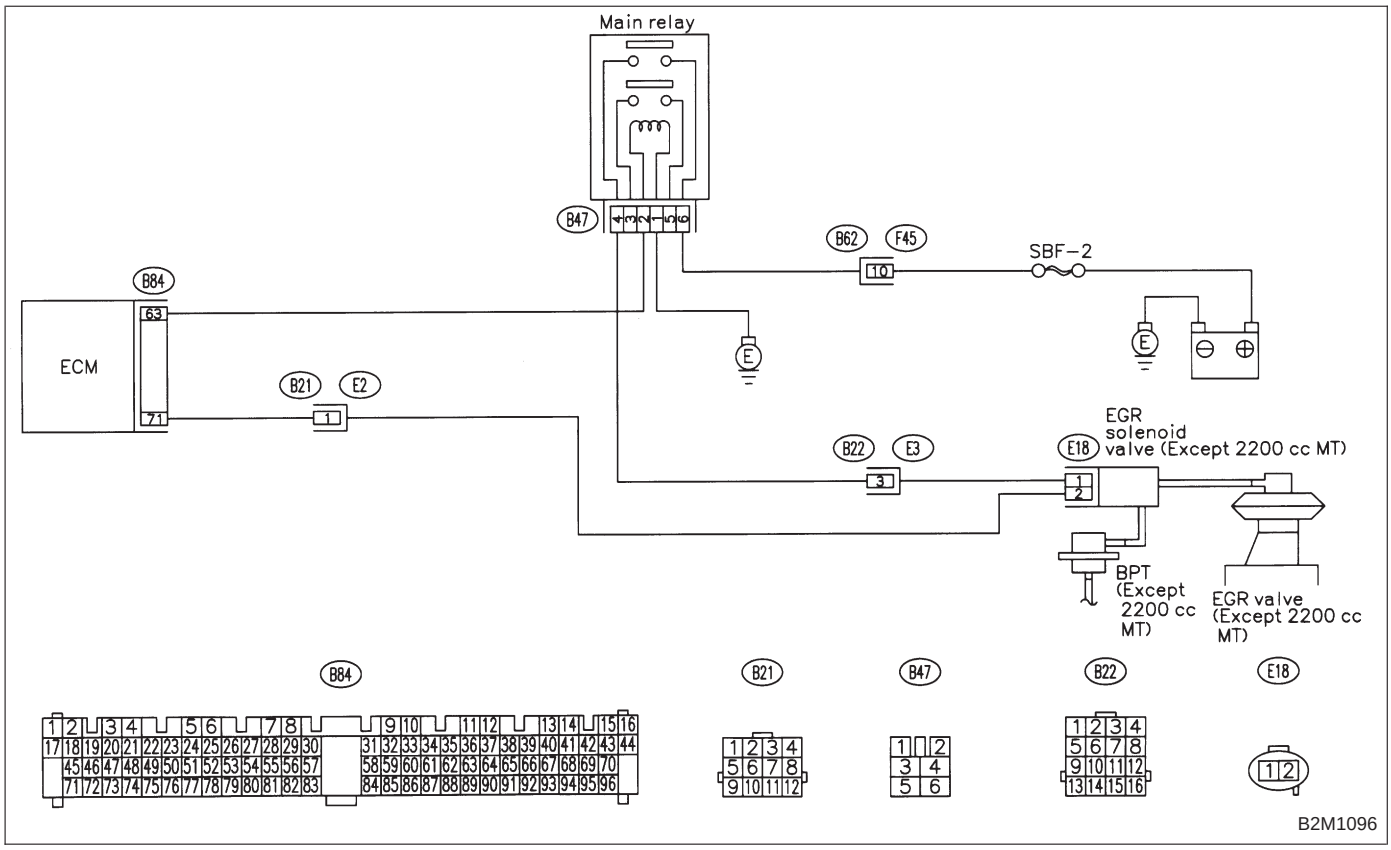
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Poor driving performance on low engine speed

WIRING DIAGRAM:



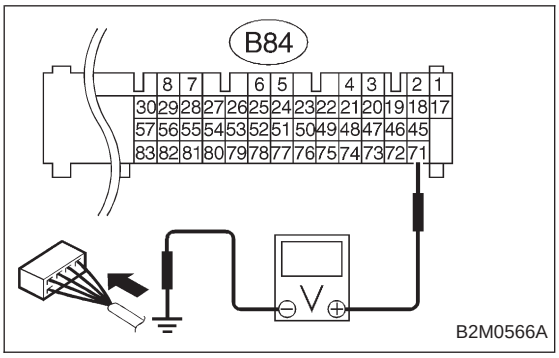
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10AP1	CHECK ENGINE/TRANSMISSION TYPE.

CHECK ***: Is engine/transmission type 2200 cc/MT?***

YES : Check AT/MT identification circuit. <Ref. to 2-7 [T10DD0].>

NO : Go to step **10AP2**.



10AP2	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal***
(B84) No. 71 (+) — Chassis ground (−):
Is the voltage more than 10 V?

YES : Go to next CHECK .

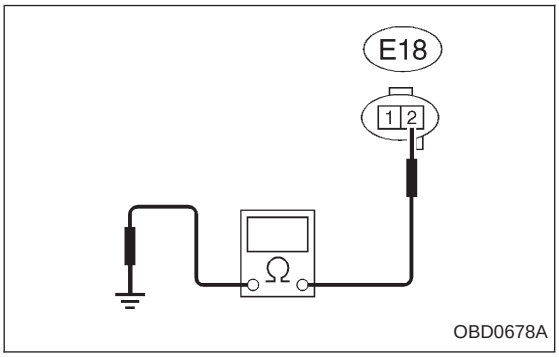
NO : Go to step **10AP3**.

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. (However, the possibility of poor contact still remains.)

NOTE:
In this case, repair the following:
- Poor contact in EGR solenoid valve connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B21)



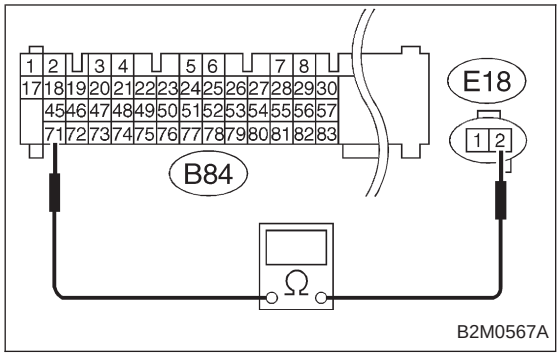
10AP3	CHECK HARNESS BETWEEN EGR SOLENOID VALVE AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connectors from EGR solenoid valve and ECM.
3) Measure resistance of harness between EGR solenoid valve connector and engine ground.

CHECK ***: Connector & terminal***
(E18) No. 2 — Engine ground:
Is the resistance less than 10 Ω?

YES : Repair ground short circuit in harness between ECM and EGR solenoid valve connector.

NO : Go to next step 4).



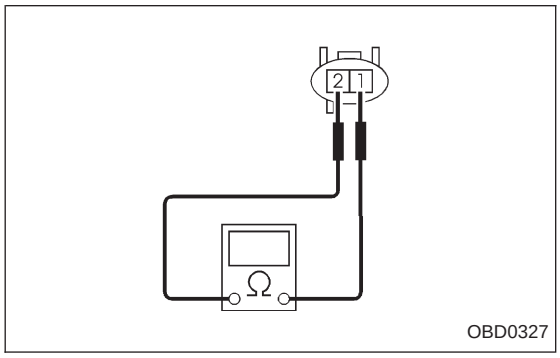
4) Measure resistance of harness between ECM and EGR solenoid valve connector.

CHECK ***: Connector & terminal***
(B84) No. 71 — (E18) No. 2:
Is the voltage less than 1 Ω?

YES : Go to step **10AP4**.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between EGR solenoid valve and ECM connector
- Poor contact in coupling connector (B21)
- Poor contact in EGR solenoid valve connector
- Poor contact in ECM connector



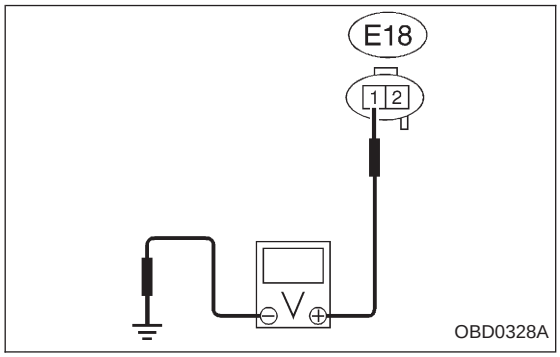
10AP4	CHECK EGR SOLENOID VALVE.

Measure resistance between EGR solenoid valve terminals.

CHECK ***: Terminals***
No. 1 — No. 2:
Is the resistance between 10 and 100 Ω?

YES : Go to step **10AP5**.

NO : Replace EGR solenoid valve.



10AP5	CHECK POWER SUPPLY TO EGR SOLENOID VALVE.

1) Turn ignition switch to ON.
2) Measure voltage between EGR solenoid valve and engine ground.

CHECK ***: Connector & terminal***
(E18) No. 1 (+) — Engine ground (−):
Is the voltage more than 10 V?

YES : Go to next CHECK .

NO : Repair open circuit in harness between main relay and EGR solenoid valve connector.

CHECK ***: Is there poor contact in EGR solenoid valve connector?***

YES : Repair poor contact in EGR solenoid valve connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

OBD	(FB1)
P0420	<CAT>

OBD0329

AQ: DTC P0420 — CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD —

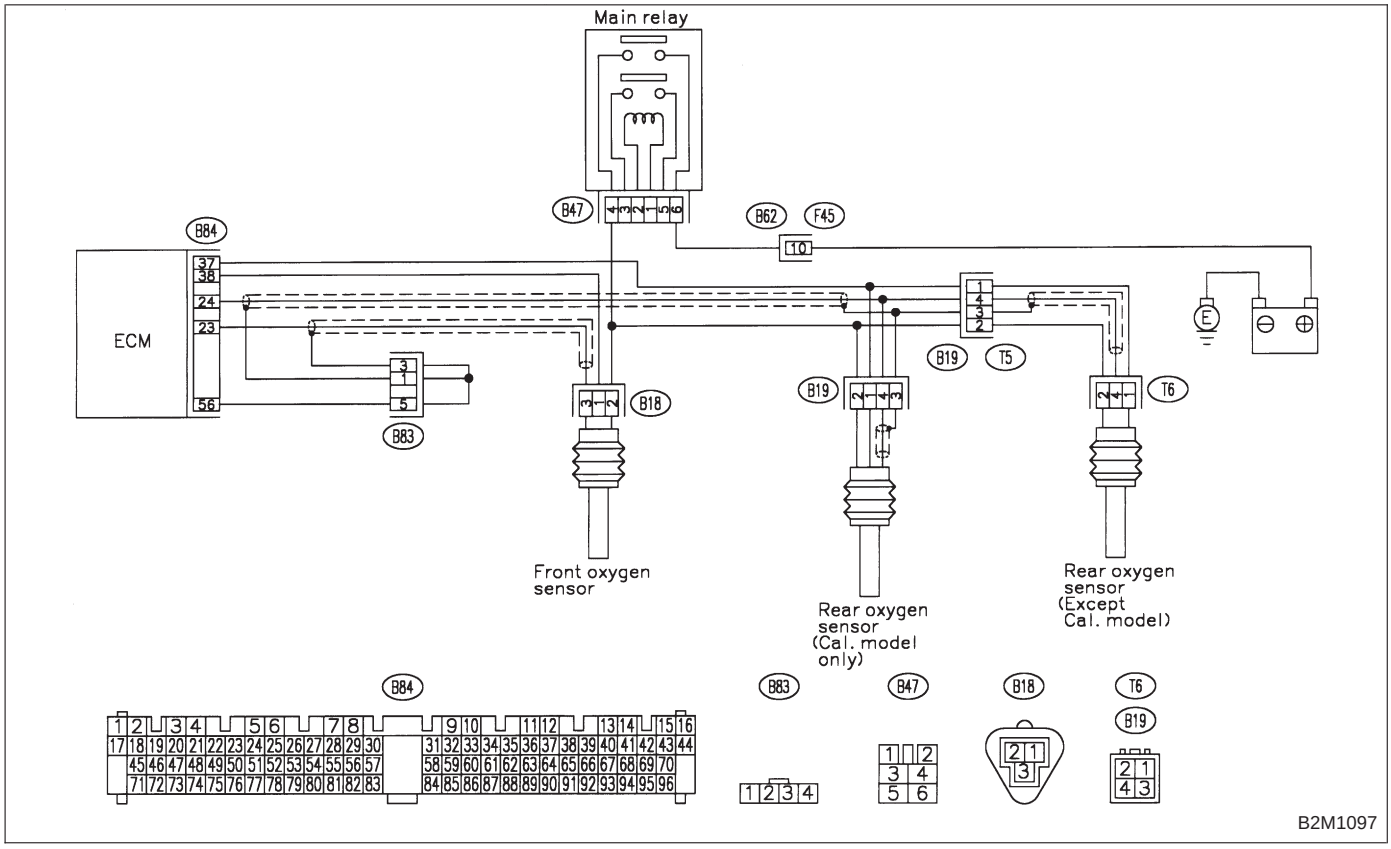
DTC DETECTING CONDITION:

- Immediately at fault recognition (2200 cc Federal spec. vehicles only)
- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Engine stalls.
- Idle mixture is out of specifications.

WIRING DIAGRAM:



B2M1097

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10AQ1	CHECK ANY OTHER DTC P0130, P0133, P0135, P0136, P0139 AND P0141 ON DISPLAY.

CHECK : ***Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0130, P0133, P0135, P0136, P0139 and P0141?***

YES : Inspect the relevant DTC using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect DTC P0420.

NO : Go to step **10AQ2**.

10AQ2	CHECK EXHAUST SYSTEM.

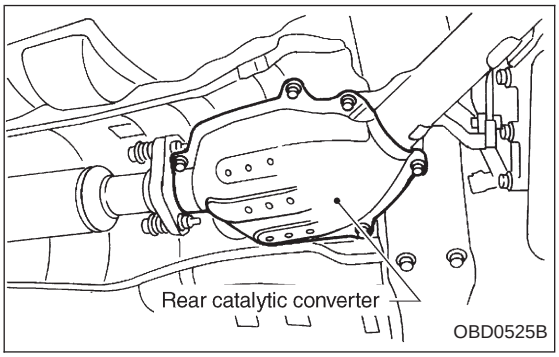
Check for gas leaks or air suction caused by loose or dislocated nuts and bolts, and open hole at exhaust pipes.

CHECK : ***Is there a fault in exhaust system?***

NOTE:
Check the following positions.
- Between cylinder head and front exhaust pipe
- Between front exhaust pipe and front catalytic converter
- Between front catalytic converter and rear catalytic converter

YES : Repair or replace exhaust system.

NO : Go to step **10AQ3**.



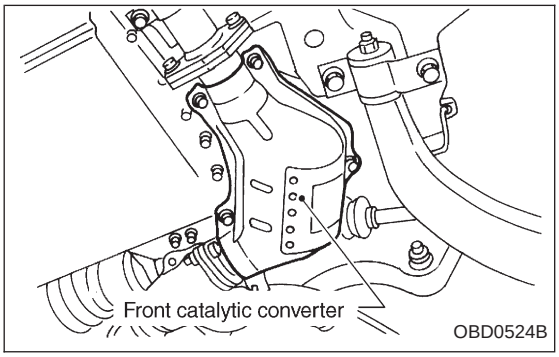
10AQ3	CHECK REAR CATALYTIC CONVERTER.

1) Separate rear catalytic converter from rear exhaust pipe.

CHECK : ***Is there damage at rear face of rear catalyst?***

YES : Replace front and rear catalytic converters.

NO : Go to next step 2).



2) Remove front catalytic converter.

CHECK : ***Is there damage at rear face or front face of front catalyst?***

YES : Replace front catalytic converter.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

OBD (FB1)
P0440 <EVAP>
H2M1365

AR: DTC P0440 — EVAPORATIVE EMISSION CONTROL SYSTEM MALFUNCTION —

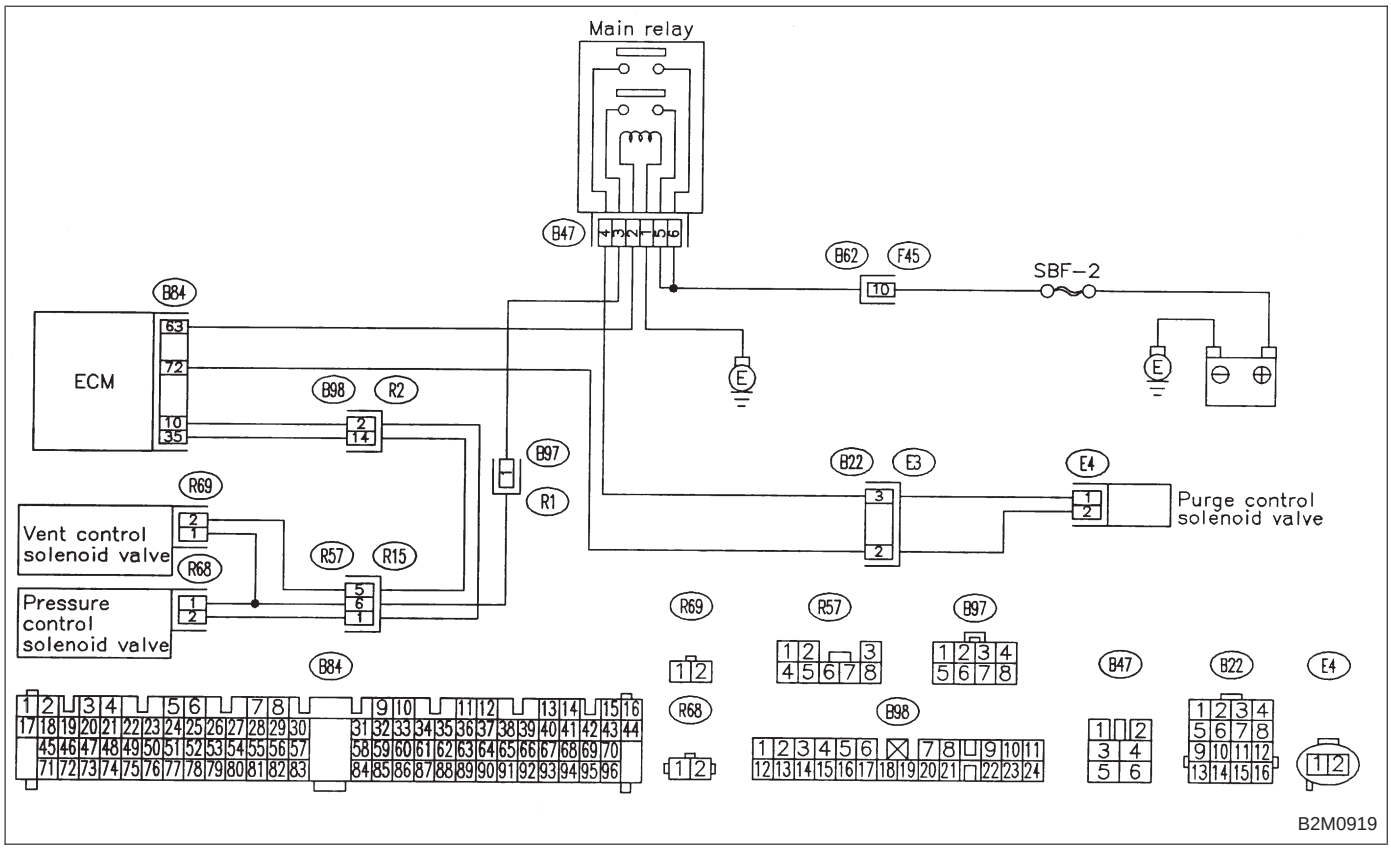
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Gasoline smell

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10AR1	CHECK ANY OTHER DTC (BESIDES DTC P0440) ON DISPLAY.

CHECK ***: Is there any other DTC on display?***

YES : Inspect the relevant DTC using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NO : Go to step **10AR2**.

10AR2	CHECK FUEL FILLER CAP AND FUEL FILLER PIPE.

1) Turn ignition switch to OFF.
2) Open the fuel flap.

CHECK ***: Is the fuel filler cap tightened securely?***

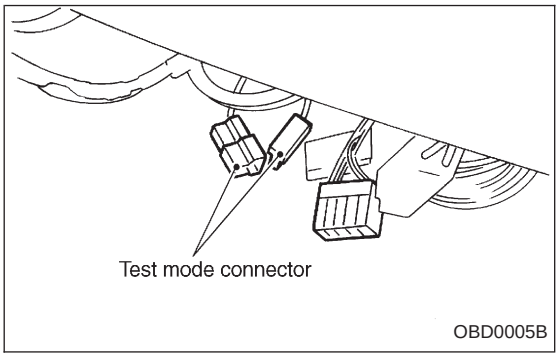
YES : Tighten fuel filler cap securely.

NO : Go to next CHECK .

CHECK ***: Is there any damage to the seal between fuel filler cap and fuel filler pipe?***

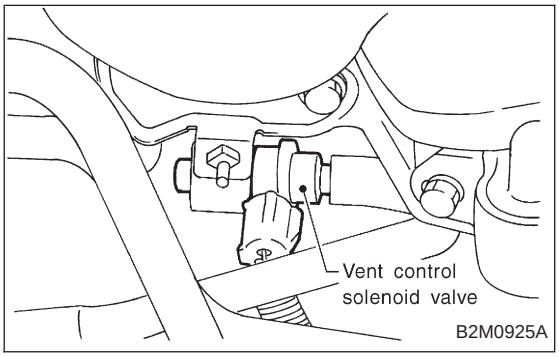
YES : Repair or replace fuel filler cap and fuel filler pipe.

NO : Go to step **10AR3**.



10AR3	CHECK VENT CONTROL SOLENOID VALVE.

1) Connect test mode connector.
2) Turn ignition switch to ON.

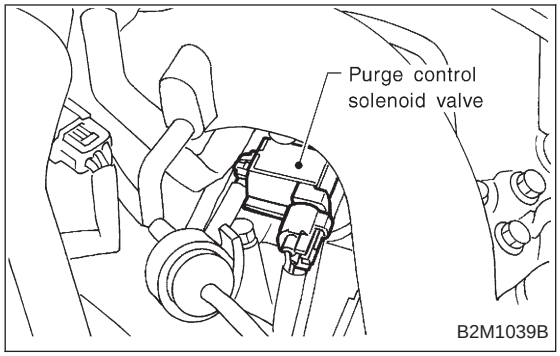


CHECK ***: Does vent control solenoid valve produce operating sound?***

NOTE:
Vent control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD08). For the procedure, refer to “COMPULSORY VALVE OPERATION CHECK MODE”. <Ref. to 2-7 [T3F0].>

YES : Go to step **10AR4**.

NO : Replace vent control solenoid valve.



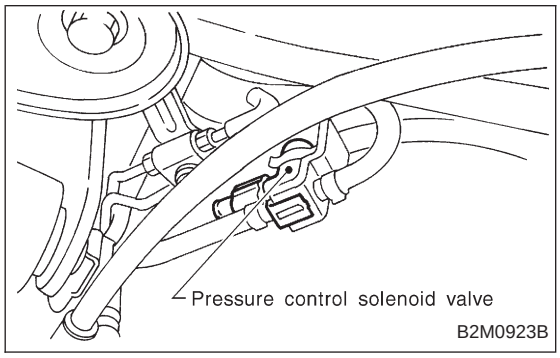
10AR4	CHECK PURGE CONTROL SOLENOID VALVE.

CHECK : ***Does purge control solenoid valve produce operating sound?***

NOTE:
Purge control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD02). For the procedure, refer to “COMPULSORY VALVE OPERATION CHECK MODE”. <Ref. to 2-7 [T3F0].>

YES : Go to step **10AR5**.

NO : Replace purge control solenoid valve.



10AR5	CHECK PRESSURE CONTROL SOLENOID VALVE.

CHECK : ***Does pressure control solenoid valve produce operating sound?***

NOTE:
Pressure control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD07). For the procedure, refer to “COMPULSORY VALVE OPERATION CHECK MODE”. <Ref. to 2-7 [T3F0].>

YES : Go to step **10AR6**.

NO : Replace pressure control solenoid valve.

10AR6	CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.

Turn ignition switch to OFF.

CHECK ***: Does fuel leak in fuel line?***

YES : Repair or replace fuel line.

NO : Go to next CHECK .

CHECK ***: Is there any damage at canister?***

YES : Repair or replace canister.

NO : Go to next CHECK .

CHECK ***: Is there any damage at fuel tank?***

YES : Repair or replace fuel tank.

NO : Go to next CHECK .

CHECK ***: Are there holes, cracks, clogging or disconnections of hoses or pipes in evaporative emission control system?***

YES : Repair or replace hoses or pipes.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

OBD (FB1)

P0441 <CPC_F>

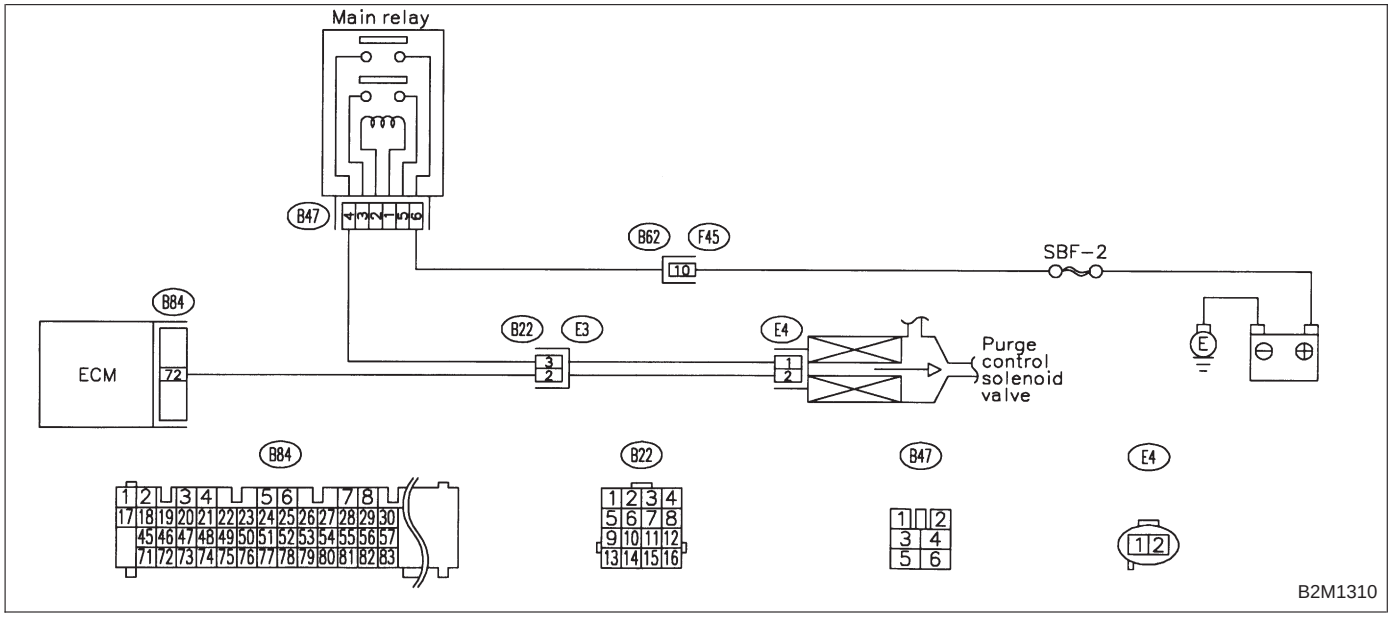
OBD0331

AS: DTC P0441 — EVAPORATIVE EMISSION CONTROL SYSTEM INCORRECT PURGE FLOW —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

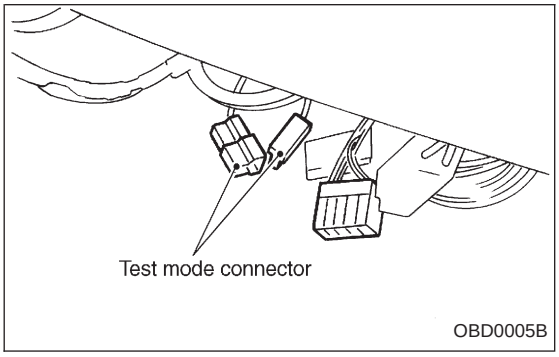
10AS1	CHECK DTC P0106, P0107, P0108, P0443, P1102, P1122 OR P1422 ON DISPLAY.

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0106, P0107, P0108, P0443, P1102, P1122 or P1422?***

YES : Inspect the relevant DTC P0106, P0107, P0108, P0443, P1102, P1122 or P1422 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect DTC P0441.

NO : Go to step **10AS2**.



10AS2	CHECK PURGE CONTROL SOLENOID VALVE OPERATION.

1) Turn ignition switch to OFF.
2) Connect test mode connector at the lower portion of instrument panel (on the driver’s side), to the side of the center console box.
3) Turn ignition switch to ON.

CHECK ***: Does purge control solenoid valve produce operating sound at about 0.3 Hz?***

NOTE:
Purge control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD02). For the procedure, refer to “COMPULSORY VALVE OPERATION CHECK MODE”. <Ref. to 2-7 [T3F0].>

YES : Go to next step 4).

NO : Replace purge control solenoid valve.

4) Disconnect canister purge hose from canister.

CHECK ***: Does pulsation occur by blowing through the canister purge hose?***

YES : Repair or replace evaporation line.

NOTE:
In this case, repair the following:
- Loose connections in evaporation line
- Cracks in evaporation line
- Clogging in evaporation line

NO : Replace purge control solenoid valve.

OBD	(FB1)
P0443	<CPC>

OBD0335

AT: DTC P0443 — EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT LOW INPUT —

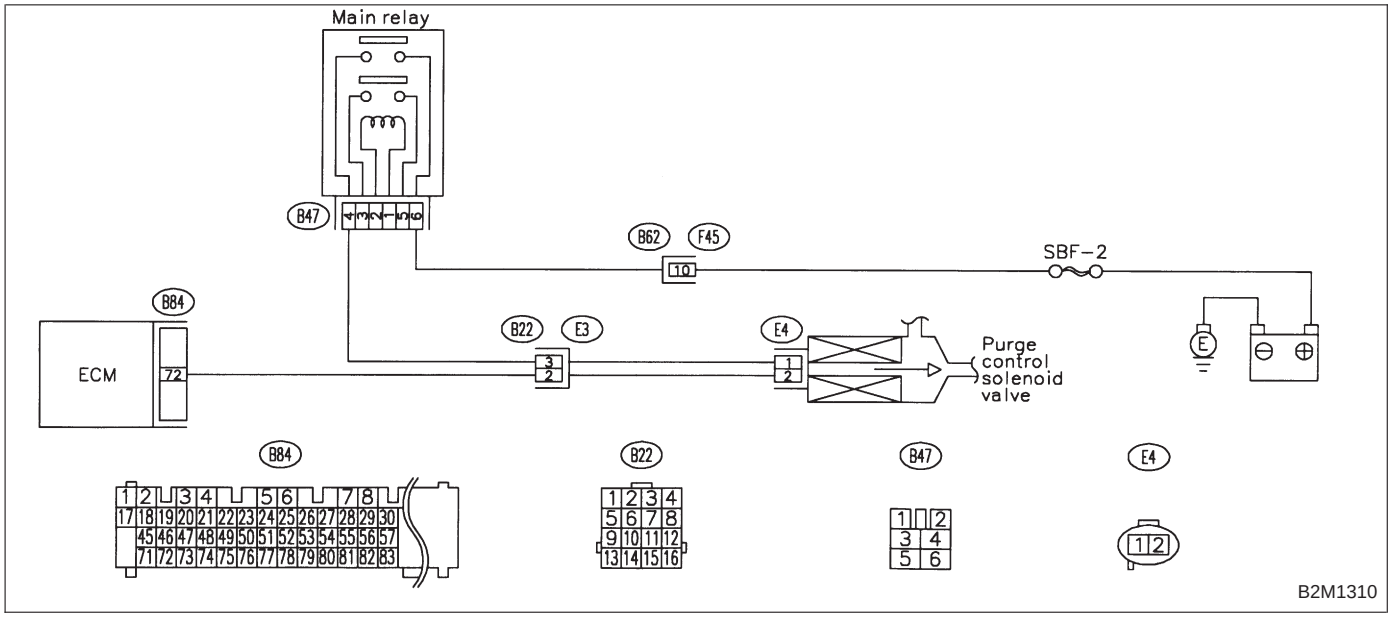
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

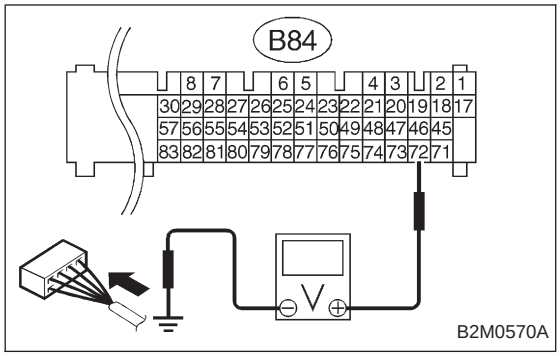
TROUBLE SYMPTOM:

- Erroneous idling

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10AT1	CHECK OUTPUT SIGNAL FROM ECM.

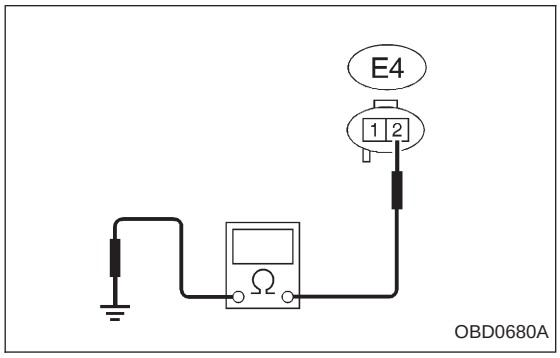
1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK : ***Connector & terminal (B84) No. 72 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Even if MIL lights up, the circuit has returned to a normal condition at this time. Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

NO : Go to step **10AT2**.



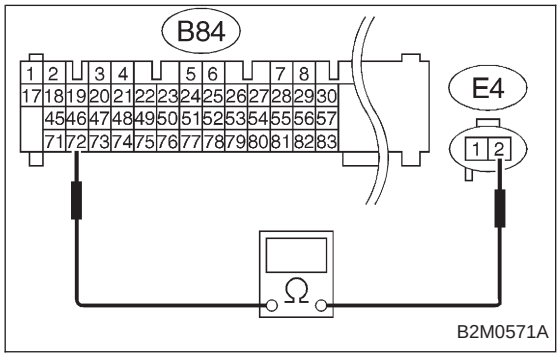
10AT2	CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connectors from purge control solenoid valve and ECM.
3) Measure resistance of harness between purge control solenoid valve connector and engine ground.

CHECK : ***Connector & terminal (E4) No. 2 — Engine ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between ECM and purge control solenoid valve connector.

NO : Go to next step 4).

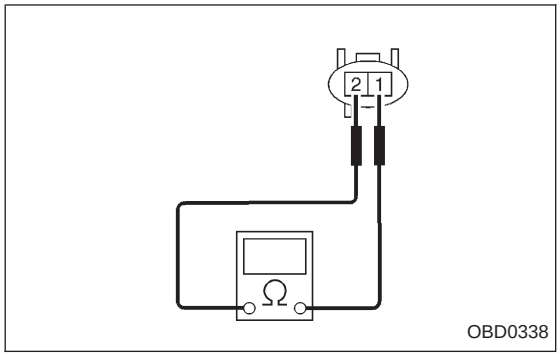


4) Measure resistance of harness between ECM and purge control solenoid valve of harness connector.

CHECK : ***Connector & terminal (B84) No. 72 — (E4) No. 2: Is the resistance less than 1 Ω?***

YES : Go to step **10AT3**.

NO : Repair open circuit in harness between ECM and purge control solenoid valve connector.



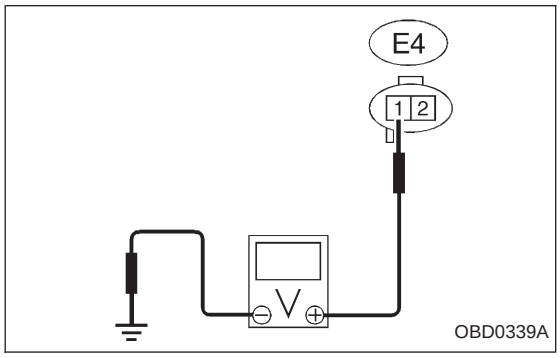
10AT3	CHECK PURGE CONTROL SOLENOID VALVE.

1) Remove purge control solenoid valve.
2) Measure resistance between purge control solenoid valve terminals.

CHECK ***: Terminals***
No. 1 — No. 2:
Is the resistance between 10 and 100 Ω?

YES : Go to step **10AT4**.

NO : Replace purge control solenoid valve.



10AT4	CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE.

1) Turn ignition switch to ON.
2) Measure voltage between purge control solenoid valve and engine ground.

CHECK ***: Connector & terminal***
(E4) No. 1 (+) — Engine ground (−):
Is the voltage more than 10 V?

YES : Go to next CHECK .

NO : Repair open circuit in harness between main relay and purge control solenoid valve connector.

CHECK ***: Is there poor contact in purge control solenoid valve connector?***

YES : Repair poor contact in purge control solenoid valve connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

OBD (FB1)

P0446<VCMSOL_LO>

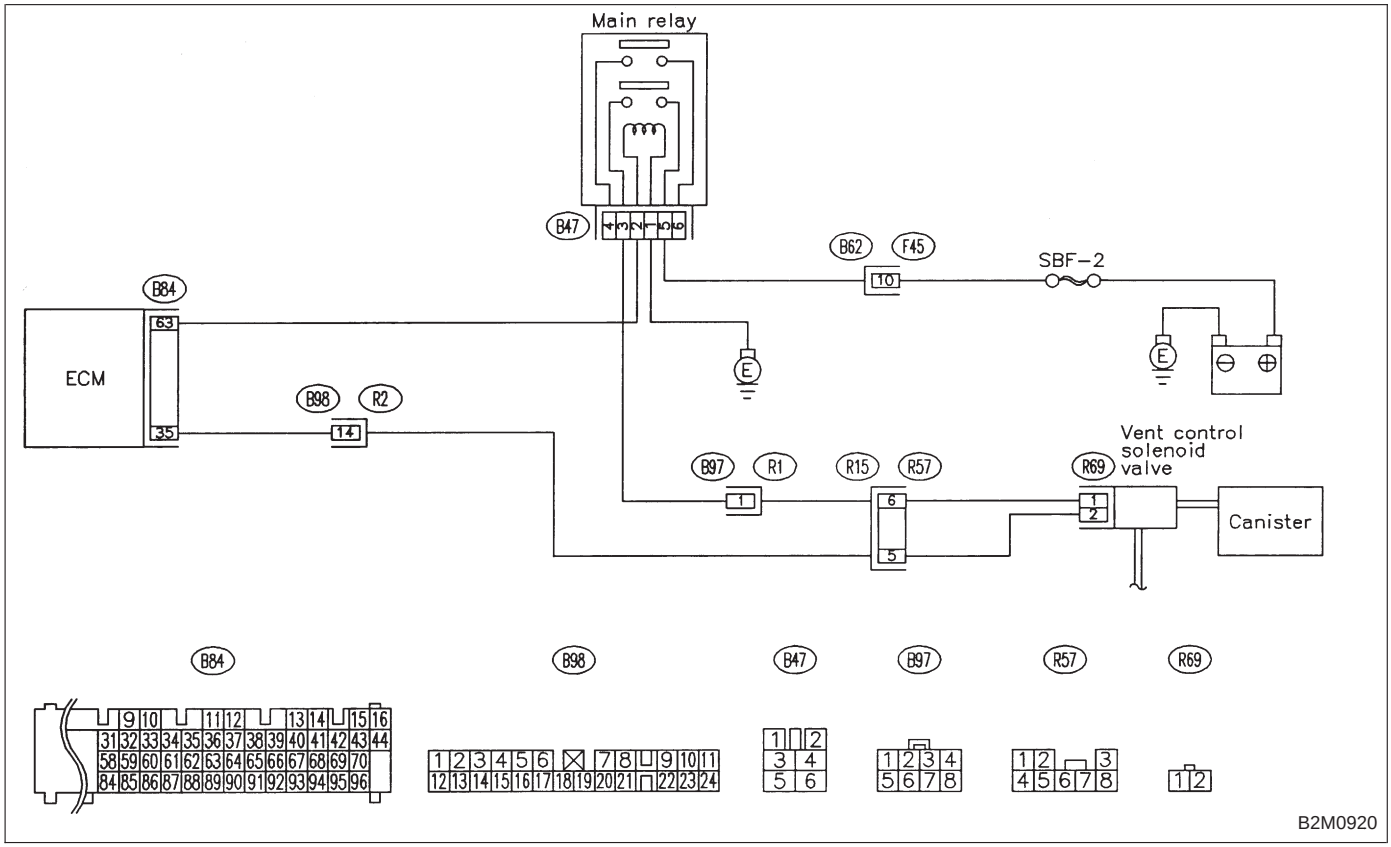
B2M1098

AU: DTC P0446 — EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL LOW INPUT —

DTC DETECTING CONDITION:

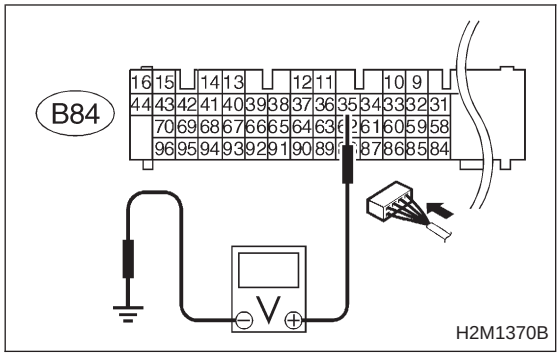
- Two consecutive driving cycles with fault

WIRING DIAGRAM:



B2M0920

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10AU1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK : ***Connector & terminal (B84) No. 35 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Go to next CHECK .

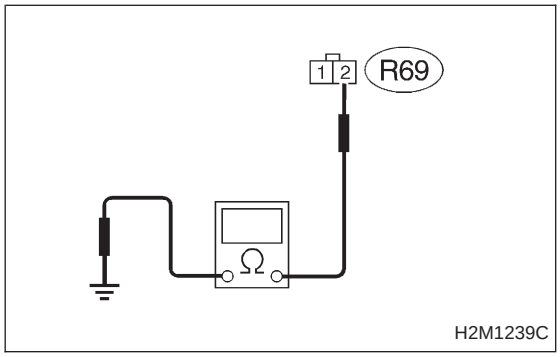
NO : Go to step **AU2**.

CHECK : ***Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. (However, the possibility of poor contact still remains.)

NOTE:
In this case, repair the following:
- Poor contact in vent control solenoid valve connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (B97, B98 and R57)



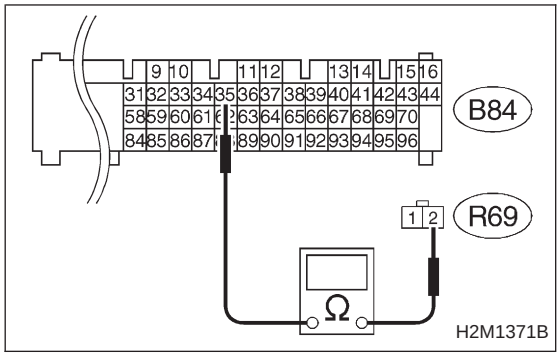
10AU2	CHECK HARNESS BETWEEN VENT CONTROL SOLENOID VALVE AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connectors from vent control solenoid valve and ECM.
3) Measure resistance of harness between vent control solenoid valve connector and chassis ground.

CHECK : ***Connector & terminal (R69) No. 2 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between ECM and vent control solenoid valve connector.

NO : Go to next step 4).



4) Measure resistance of harness between ECM and vent control solenoid valve connector.

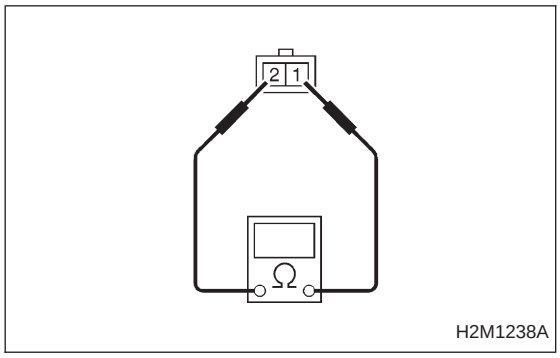
CHECK : ***Connector & terminal (B84) No. 35 — (R69) No. 2: Is the voltage less than 1 Ω?***

YES : Go to step **10AU3**.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:

● Open circuit in harness between ECM and vent control solenoid valve connector
● Poor contact in coupling connectors (B98 and R57)



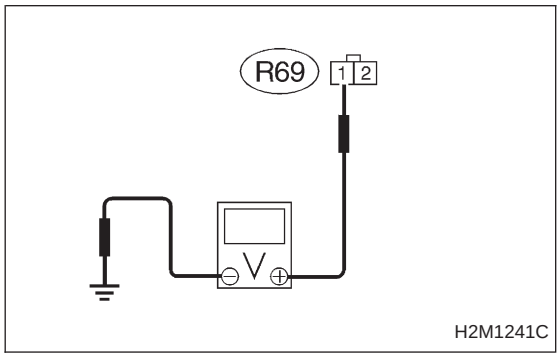
10AU3	CHECK VENT CONTROL SOLENOID VALVE.

Measure resistance between vent control solenoid valve terminals.

CHECK : ***Terminals***
No. 1 — No. 2:
Is the resistance between 10 and 100 Ω?

YES : Go to step **10AU4**.

NO : Replace vent control solenoid valve.



10AU4	CHECK POWER SUPPLY TO VENT CONTROL SOLENOID VALVE.

1) Turn ignition switch to ON.
2) Measure voltage between vent control solenoid valve and chassis ground.

CHECK : ***Connector & terminal***
(R69) No. 1 (+) — Chassis ground (−):
Is the voltage more than 10 V?

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
● Open circuit in harness between main relay and vent control solenoid valve
● Poor contact in coupling connectors (B97 and R57)
● Poor contact in main relay connector

CHECK : ***Is there poor contact in vent control solenoid valve connector?***

YES : Repair poor contact in vent control solenoid valve connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

OBD (FB1)

P0451 <TNKP_F>

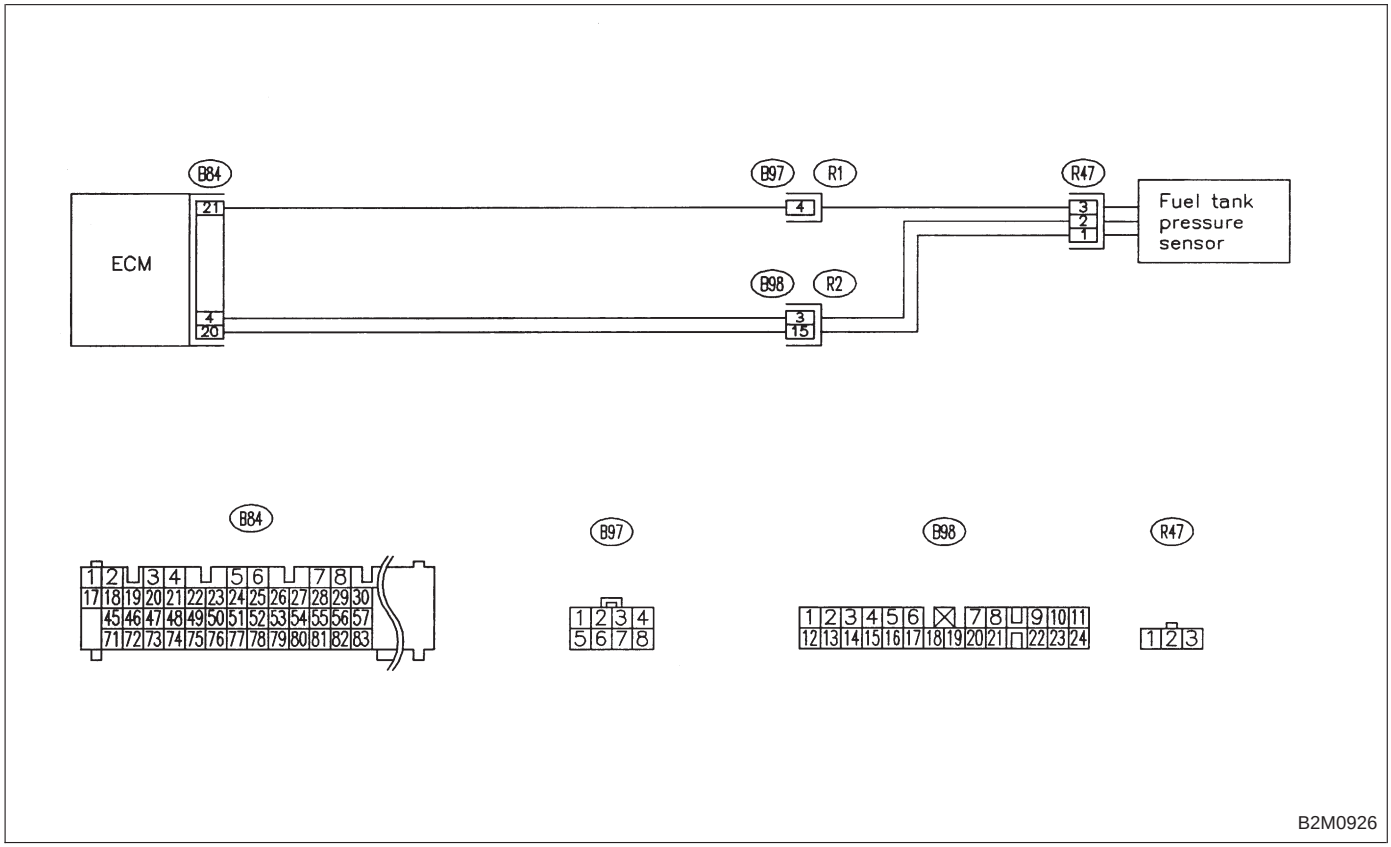
H2M1377

AV: DTC P0451 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR RANGE/PERFORMANCE PROBLEM —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



B2M0926

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10AV1	CHECK PRESSURE/VACUUM LINE.

CHECK ***: Is there a fault in pressure/vacuum line?***

NOTE:
Check the following items.

- Disconnection, leakage and clogging of the vacuum hoses and pipes between fuel tank pressure sensor and fuel tank
- Disconnection, leakage and clogging of air ventilation hoses and pipes between fuel filler pipe and fuel tank

YES : Repair or replace hoses and pipes.

NO : Replace fuel tank pressure sensor.

OBD (FB1)

P0452 <TNKP_LOW>

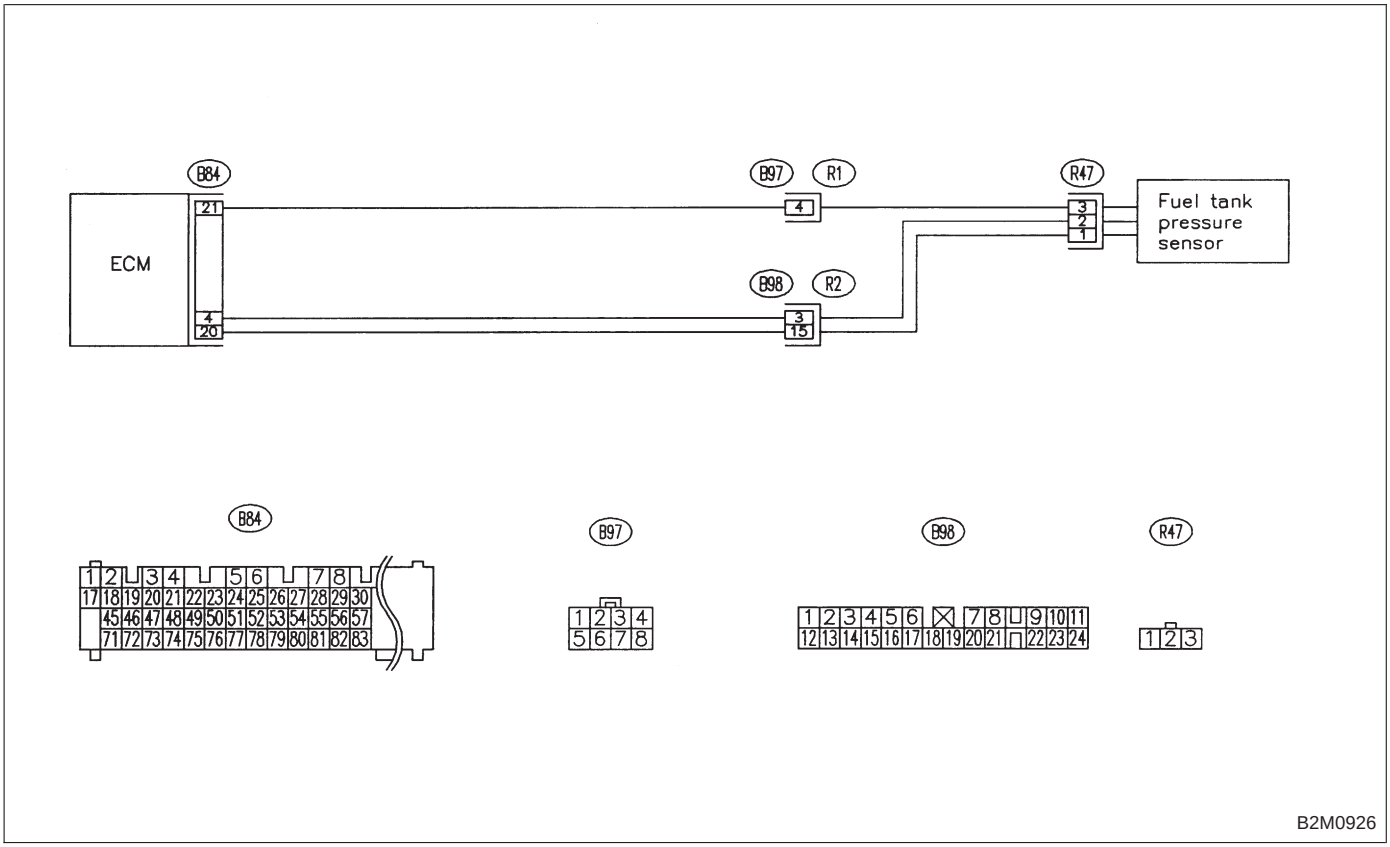
B2M1099

AW: DTC P0452 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT —

DTC DETECTING CONDITION:

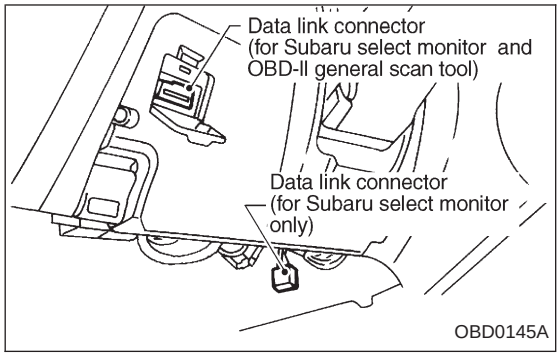
- Immediately at fault recognition

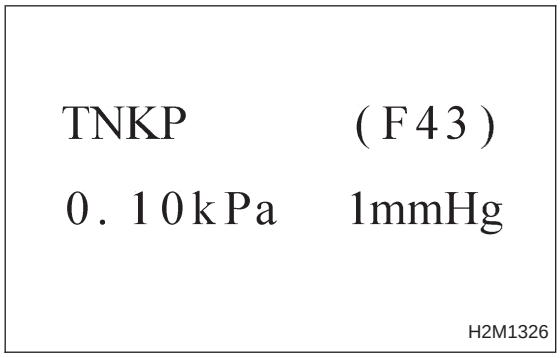
WIRING DIAGRAM:



B2M0926

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>





10AW1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

1) Turn ignition switch to OFF.
2) Remove fuel filler cap.
3) Install fuel filler cap.
4) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
5) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
6) Read the data on Subaru Select Monitor or the OBD-II general scan tool.

● Subaru Select Monitor

Designate mode using function key.

Function mode: F43

● F43: Display shows pressure signal value sent from fuel tank pressure sensor.

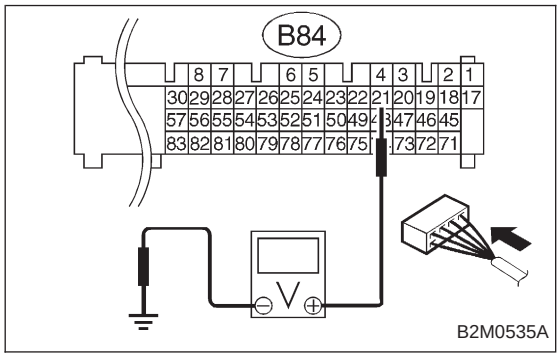
CHECK ***: Is the value less than −2.8 kPa in function mode F43?***

YES : Go to step **10AW2**.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time.

● OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



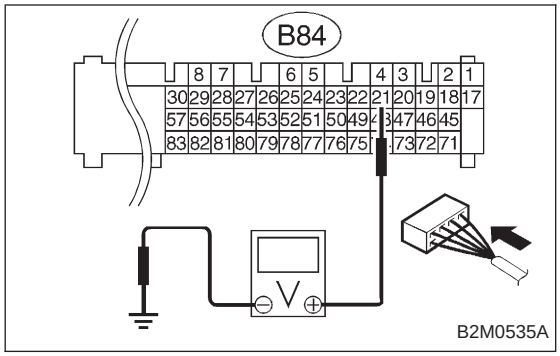
10AW2	CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

1) Measure voltage between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 21 (+) — Chassis ground (−): Is the voltage more than 4.5 V?***

YES : Go to next step 2).

NO : Go to next CHECK .

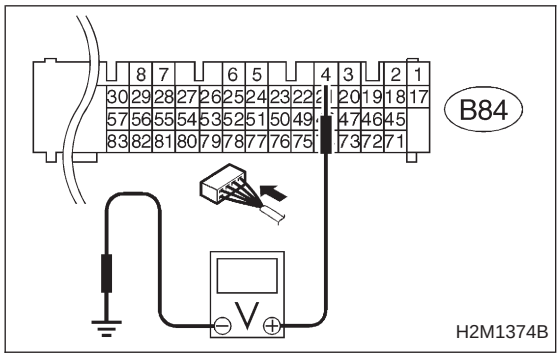


CHECK : ***Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?***

YES : Repair poor contact in ECM connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

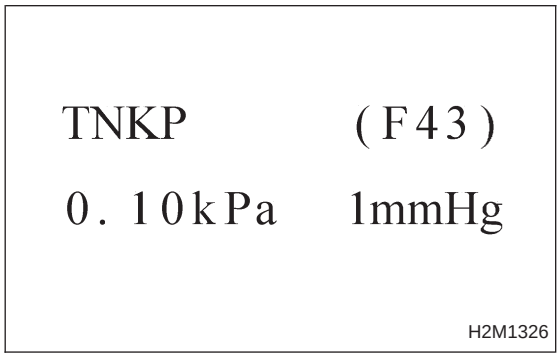


2) Measure voltage between ECM and chassis ground.

CHECK : ***Connector & terminal (B84) No. 4 (+) — Chassis ground (−): Is the voltage less than 0.2 V?***

YES : Go to step **10AW3**.

NO : Go to next step 3).



3) Read data on Subaru Select Monitor.

● Subaru Select Monitor

Designate mode using function key.

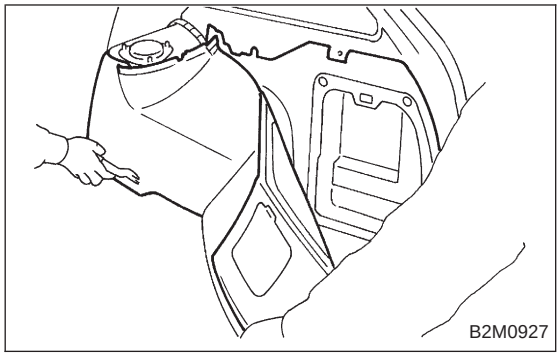
Function mode: F43

● F43: Display shows pressure signal value sent from fuel tank pressure sensor.

CHECK : ***Does the value change more than −2.8 kPa by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?***

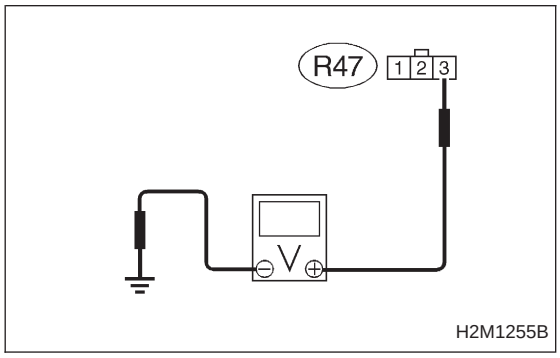
YES : Repair poor contact in ECM connector.

NO : Go to step **10AW3**.


B2M0927

10AW3	CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.

1) Turn ignition switch to OFF.
2) Detach right side trunk side trim panel (Sedan) or right side rear quarter trim panel (Wagon).
3) Remove right side rear quarter trim pocket (Wagon model only).
4) Detach right side rear quarter insulator (Wagon model only).



H2M1255B

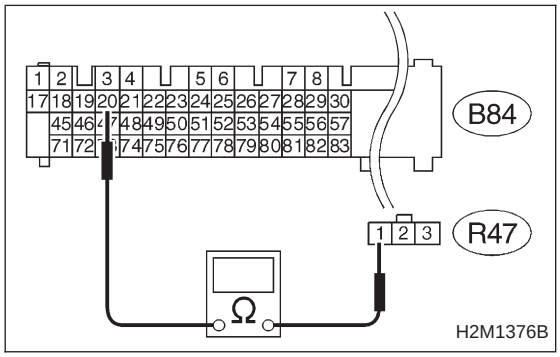
5) Disconnect connector from fuel tank pressure sensor.
6) Turn ignition switch to ON.
7) Measure voltage between fuel tank pressure sensor connector and chassis ground.

CHECK ***: Connector & terminal***
(R47) No. 3 (+) — Chassis ground (−):
Is the voltage more than 4.5 V?

YES : Go to next step 8).
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and fuel tank pressure sensor connector
- Poor contact in coupling connector (B97)

8) Turn ignition switch to OFF.
9) Disconnect connector from ECM.
10) Measure resistance of harness between ECM and pressure sensor connector.

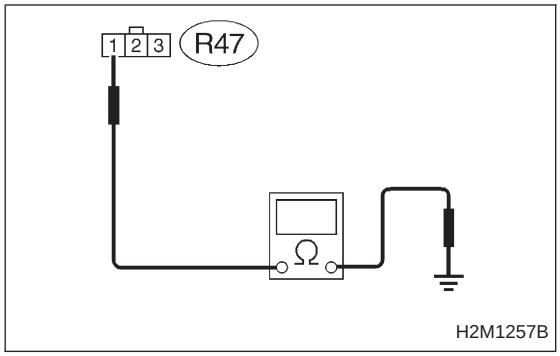


H2M1376B

CHECK ***: Connector & terminal***
(B84) No. 20 — (R47) No. 1:
Is the resistance less than 1 Ω?

YES : Go to next step 11).
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and fuel tank pressure sensor connector
- Poor contact in coupling connector (B98)



11) Measure resistance of harness between fuel tank pressure sensor connector and chassis ground.

CHECK ***: Connector & terminal (R47) No. 1 — Chassis ground: Is the resistance more than 500 kΩ?***

YES : Go to next CHECK .

NO : Repair ground short circuit in harness between ECM and fuel tank pressure sensor connector.

CHECK ***: Is there poor contact in fuel tank pressure sensor connector?***

YES : Repair poor contact in fuel tank pressure sensor connector.

NO : Replace fuel tank pressure sensor.

OBD (FB1)

P0453 <TNKP_HI>

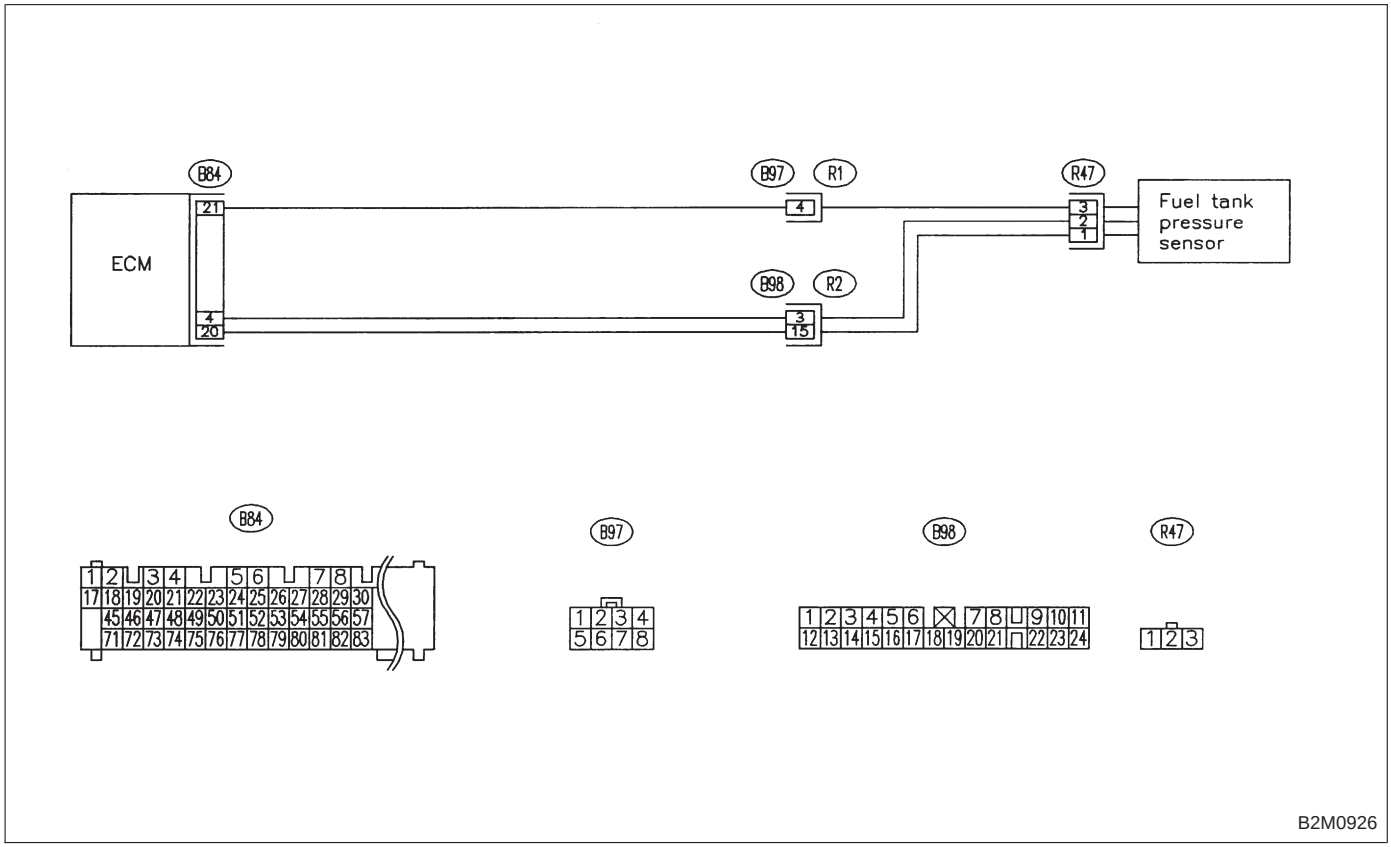
B2M1100

AX: DTC P0453 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT —

DTC DETECTING CONDITION:

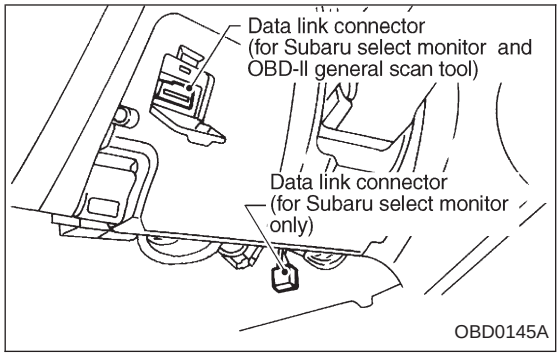
- Immediately at fault recognition

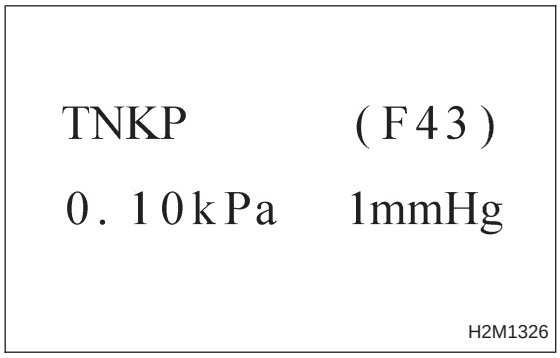
WIRING DIAGRAM:



B2M0926

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>





10AX1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

1) Turn ignition switch to OFF.
2) Remove fuel filler cap.
3) Install fuel filler cap.
4) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
5) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
6) Read the data on Subaru Select Monitor or the OBD-II general scan tool.

● Subaru Select Monitor

Designate mode using function key.

Function mode: F43

● F43: Display shows pressure signal value sent from fuel tank pressure sensor.

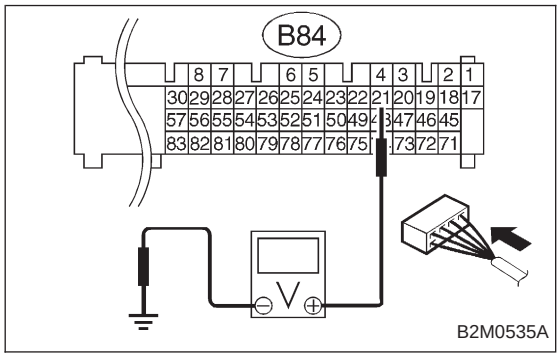
CHECK ***: Is the value more than 2.8 kPa in function mode F43?***

YES : Go to step **10AX4**.

NO : Go to step **10AX2**.

● OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



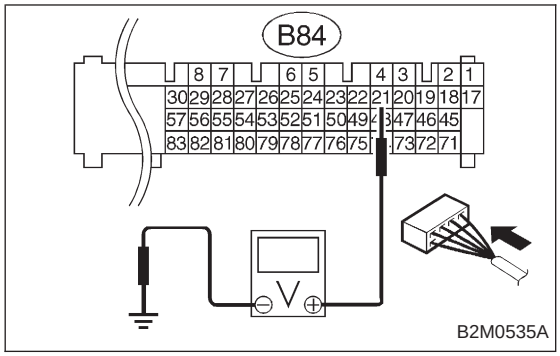
10AX2	CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

1) Measure voltage between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 21 (+) — Chassis ground (−): Is the voltage more than 4.5 V?***

YES : Go to next step 2).

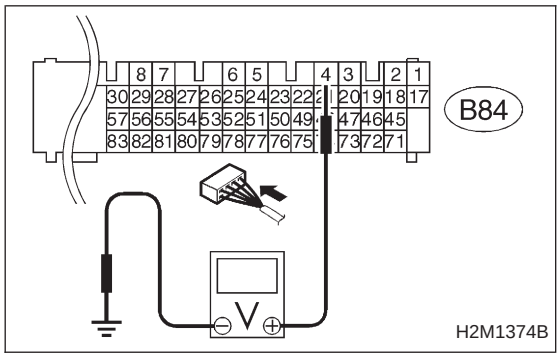
NO : Go to next CHECK .



CHECK : ***Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.

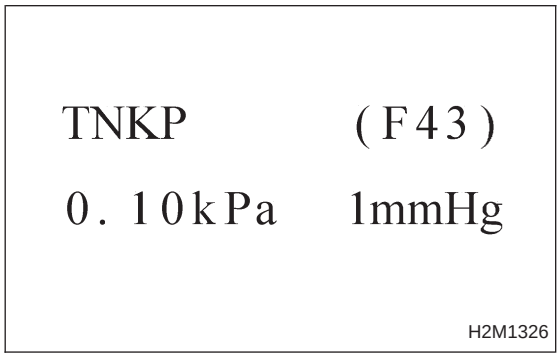


2) Measure voltage between ECM and chassis ground.

CHECK : ***Connector & terminal (B84) No. 4 (+) — Chassis ground (−): Is the voltage less than 0.2 V?***

YES : Go to step **10AX3**.

NO : Go to next step 3).



3) Read data on Subaru Select Monitor.

● Subaru Select Monitor

Designate mode using function key.

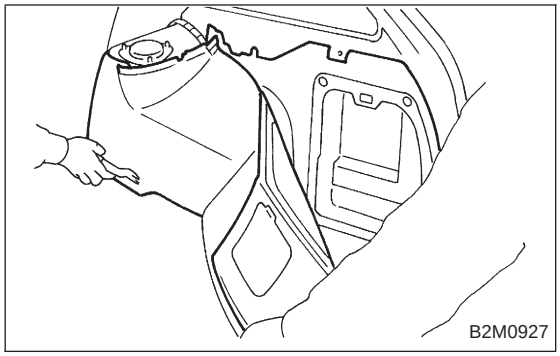
Function mode: F43

● F43: Display shows pressure signal value sent from fuel tank pressure sensor.

CHECK : ***Does the value change more than −2.8 kPa by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?***

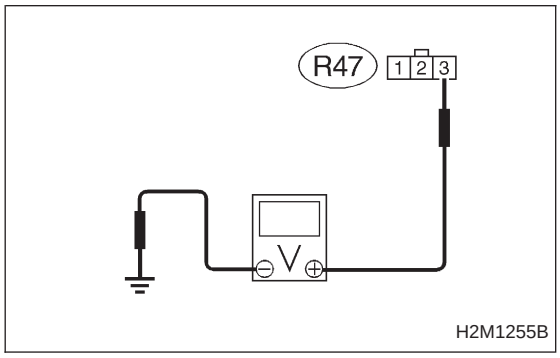
YES : Repair poor contact in ECM connector.

NO : Go to step **10AX3**.



10AX3	**CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.**

1) Turn ignition switch to OFF.
2) Detach right side trunk side trim panel (Sedan) or right side rear quarter trim panel (Wagon).
3) Remove right side rear quarter trim pocket (Wagon model only).
4) Detach right side rear quarter insulator (Wagon model only).

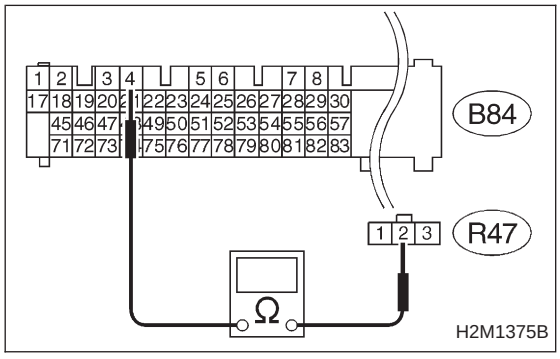


5) Disconnect connector from fuel tank pressure sensor.
6) Turn ignition switch to ON.
7) Measure voltage between fuel tank pressure sensor connector and chassis ground.

CHECK ***: Connector & terminal***
(R47) No. 3 (+) — Chassis ground (−):
Is the voltage more than 4.5 V?

YES : Go to next step 8).
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and fuel tank pressure sensor connector
- Poor contact in coupling connector (B97)

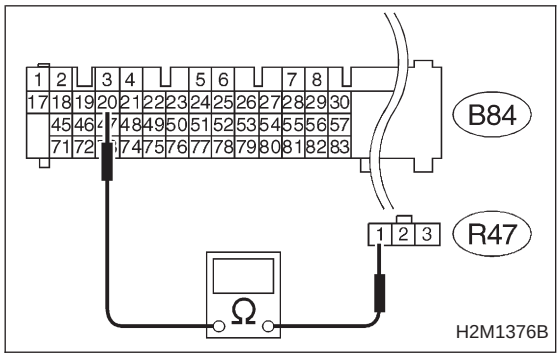


8) Turn ignition switch to OFF.
9) Disconnect connector from ECM.
10) Measure resistance of harness between ECM and pressure sensor connector.

CHECK ***: Connector & terminal***
(B84) No. 4 — (R47) No. 2:
Is the resistance less than 1 Ω?

YES : Go to next CHECK .
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
● Open circuit in harness between ECM and fuel tank pressure sensor connector
● Poor contact in coupling connector (B98)



CHECK ***: Connector & terminal (B84) No. 20 — (R47) No. 1: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

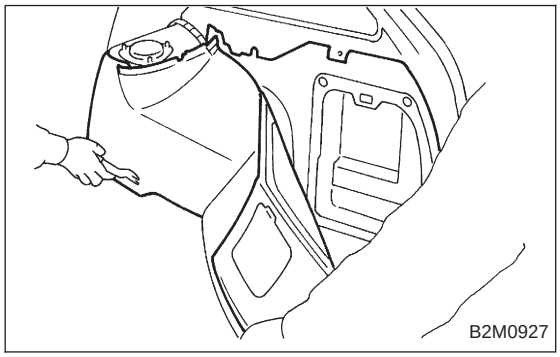
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
● Open circuit in harness between ECM and fuel tank pressure sensor connector
● Poor contact in coupling connector (B98)

CHECK ***: Is there poor contact in fuel tank pressure sensor connector?***

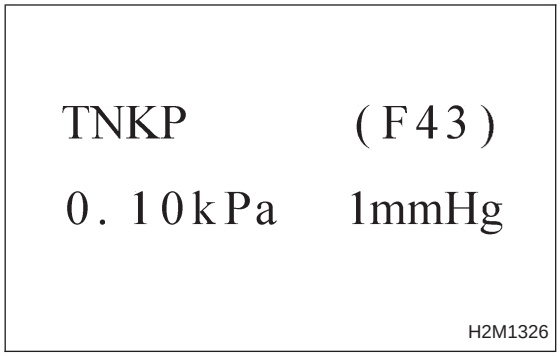
YES : Repair poor contact in fuel tank pressure sensor connector.

NO : Replace fuel tank pressure sensor.



10AX4	**CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.**

1) Turn ignition switch to OFF and Subaru Select Monitor or the OBD-II general scan tool switch to OFF.
2) Detach right side trunk side trim panel (Sedan) or right side rear quarter trim panel (Wagon).
3) Remove right side rear quarter trim pocket (Wagon model only).
4) Detach right side rear quarter insulator (Wagon model only).



5) Disconnect connector from fuel tank pressure sensor.
6) Remove fuel filler cap.
7) Install fuel filler cap.
8) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
9) Read data on Subaru select monitor or the OBD-II general scan tool.
● Subaru Select Monitor
Designate mode using function key.

Function mode: F43

CHECK ***: Is the value more than 2.8 kPa in function mode F43?***

YES : Repair battery short circuit in harness between ECM and fuel tank pressure sensor connector.

NO : Replace fuel tank pressure sensor.

● OBD-II general scan tool
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

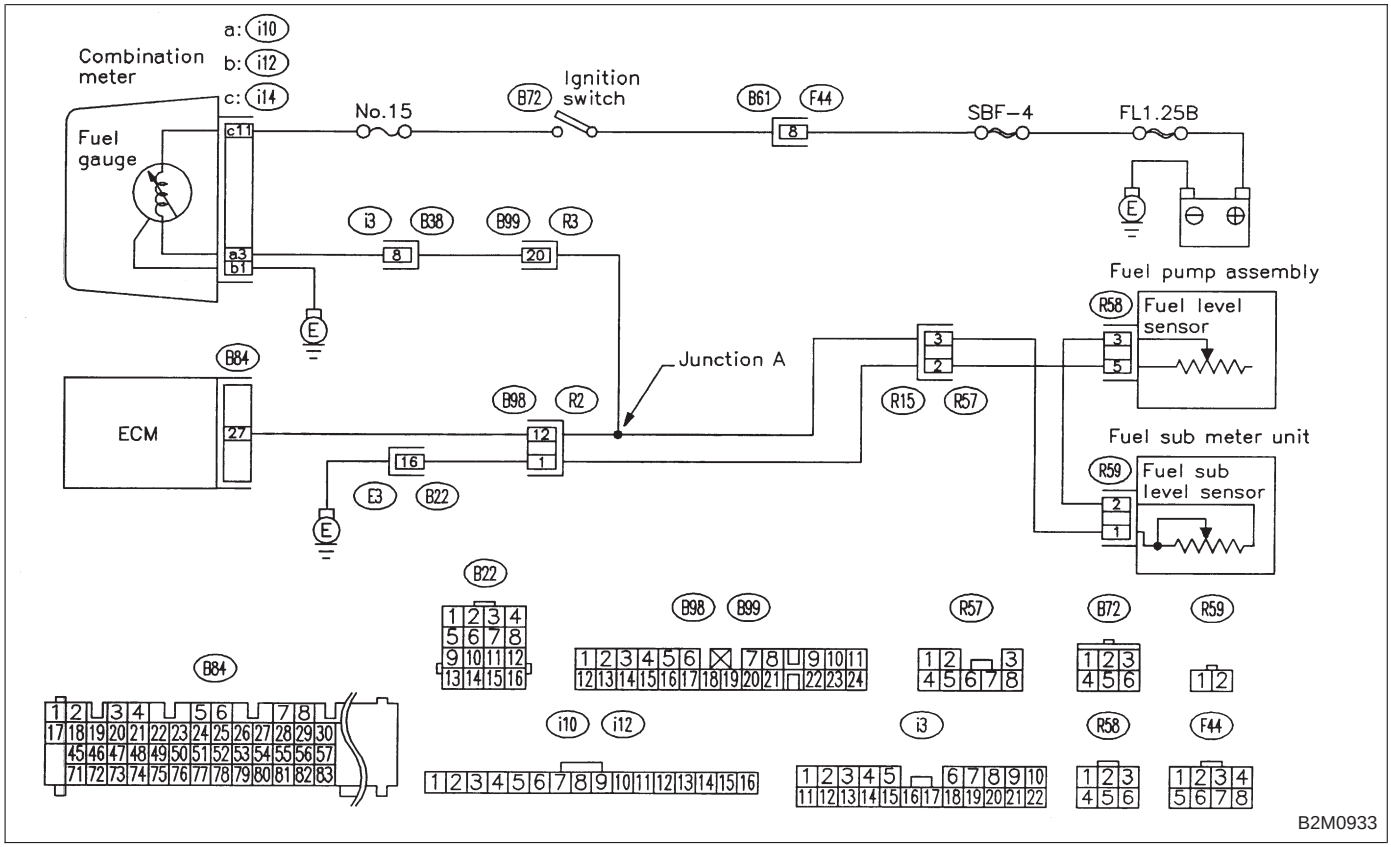
OBD (FB1)
P0461 <FLVL_R>
B2M1101

AY: DTC P0461 — FUEL LEVEL SENSOR CIRCUIT RANGE/ PERFORMANCE PROBLEM —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10AY1	**CHECK DTC P0462 OR P0463 ON DISPLAY.**

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0462 or P0463?***

YES : Inspect DTC P0462 or P0463 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect this trouble.

NO : Replace fuel sending unit and fuel sub meter unit.

OBD (FB1)

P0462 <FLVL_LOW>

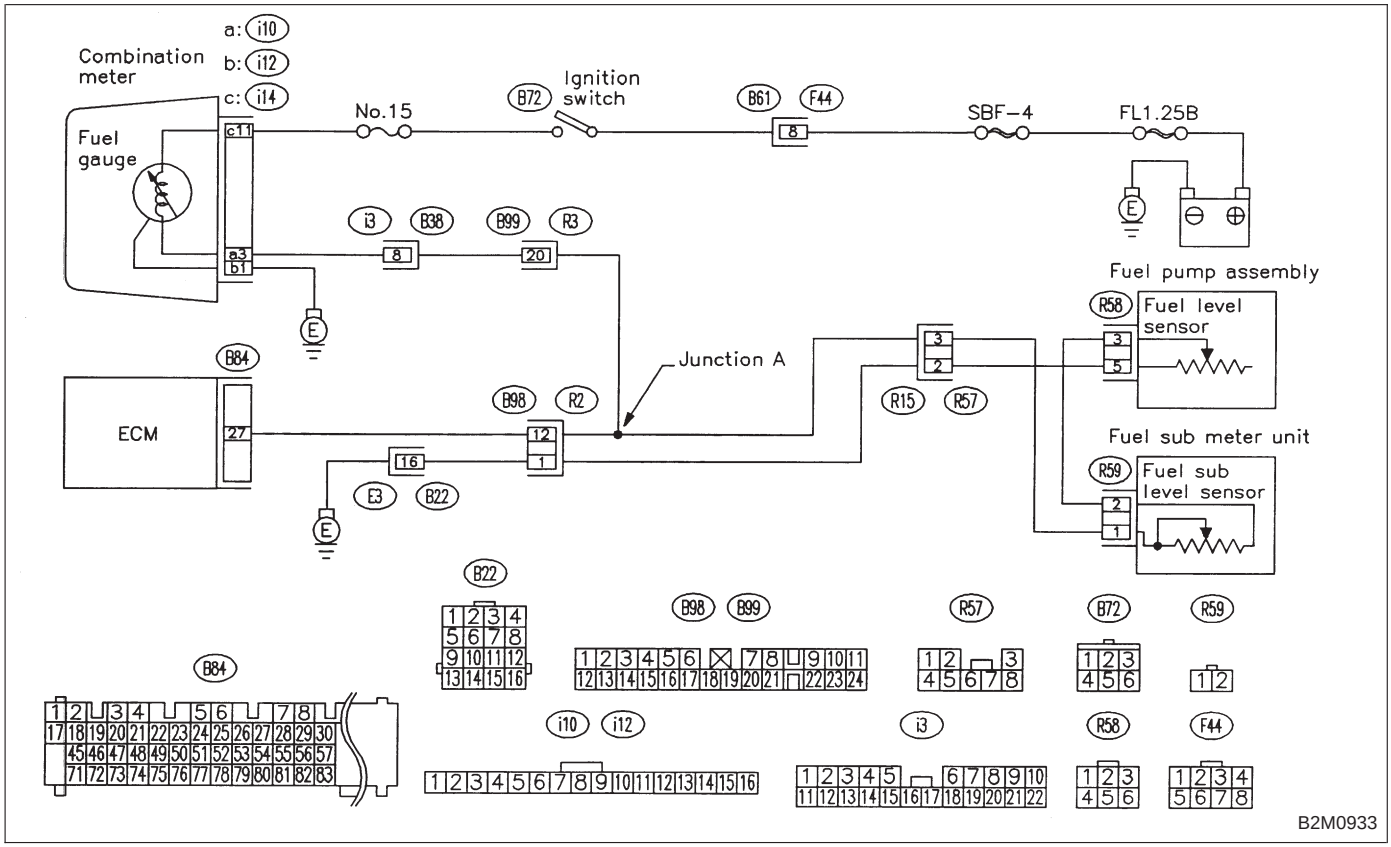
B2M1102

AZ: DTC P0462 — FUEL LEVEL SENSOR CIRCUIT LOW INPUT —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



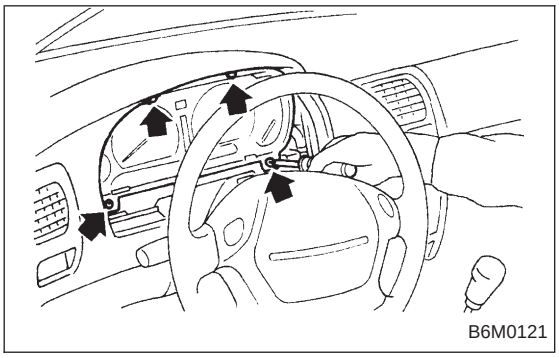
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10AZ1	**CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.**

CHECK ***: Does speedometer and tachometer operate normally?***

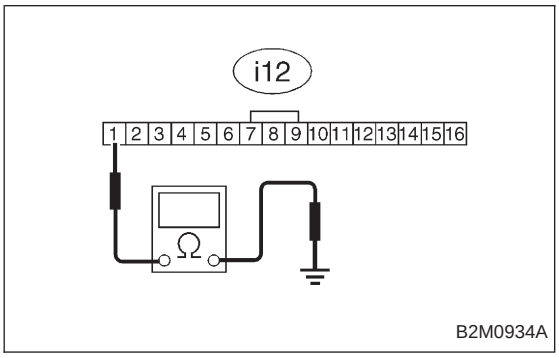
YES : Go to step **10AZ3**.

NO : Go to step **10AZ2**.


B6M0121

10AZ2	**CHECK GROUND CIRCUIT OF COMBINATION METER.**

1) Turn ignition switch to OFF.
2) Pull out combination meter from instrument panel. <Ref. to 6-2 [W13A1].>
3) Disconnect connector from combination meter.



B2M0934A

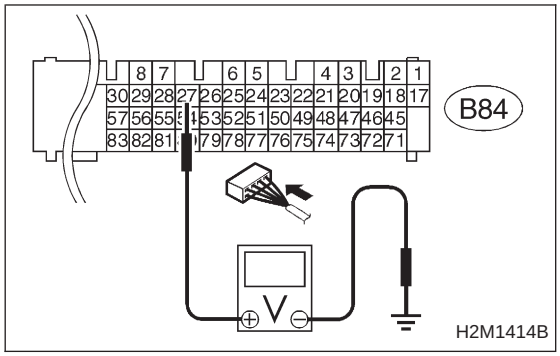
4) Measure resistance of harness between combination meter connector and chassis ground.

CHECK ***: Connector & terminal (i12) No. 1 — Chassis ground: Is resistance less than 5 Ω?***

YES : Repair or replace combination meter.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between combination meter connector and grounding terminal
- Poor contact in combination meter connector
- Poor contact in grounding terminal



10AZ3	CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

1) Turn ignition switch to ON. (Engine OFF)
2) Measure voltage between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 27 (+) — Chassis ground (−): Is the voltage less than 0.12 V?***

YES : Go to step **10AZ4**.

NO : Go to next CHECK .

CHECK ***: Does the value change less than 0.12 V by shaking harness and connector of ECM while monitoring the value with Subaru Select Monitor?***

- Subaru Select Monitor

Designate mode using function key.

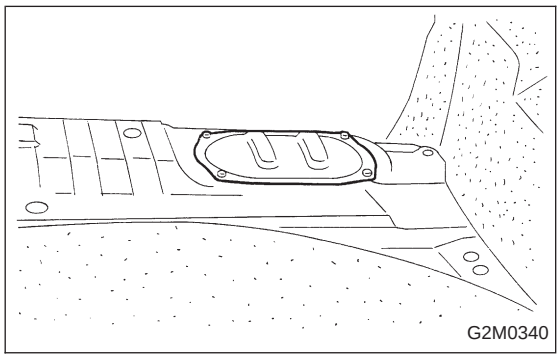
Function mode: F45

- F45: Fuel level sensor output signal is indicated.

YES : Repair poor contact in ECM connector.

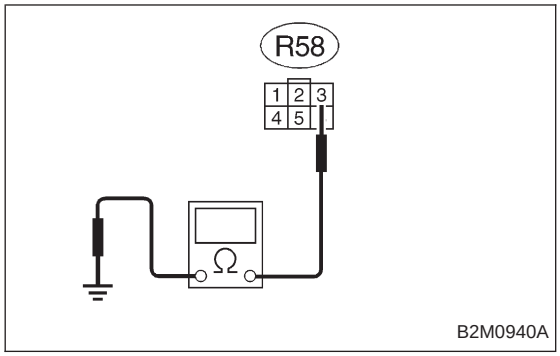
NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.

NOTE:
In this case, repair the following:
- Poor contact in fuel pump connector
- Poor contact in combination meter connector
- Poor contact in ECM connector
- Poor contact in coupling connector (i3, B99, B22, B98 and R57)



10AZ4	CHECK HARNESS BETWEEN ECM, COMBINATION METER AND FUEL PUMP CONNECTOR.

1) Turn ignition switch to OFF.
2) Remove fuel pump access hole lid located on the right rear of trunk compartment floor (Sedan) or luggage compartment floor (Wagon).

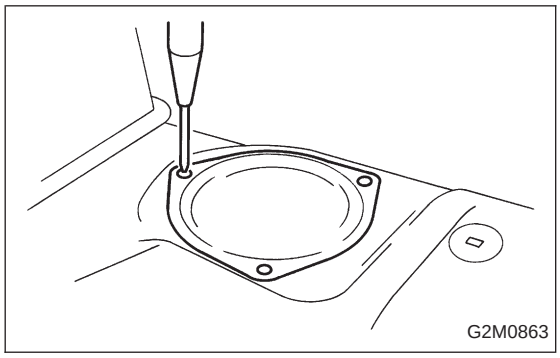


3) Disconnect connector from fuel pump.
4) Measure resistance of harness between fuel pump connector and chassis ground.

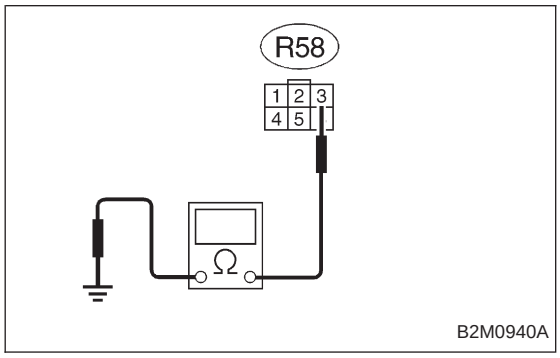
CHECK ***: Connector & terminal (R58) No. 3 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Go to next step 5).

NO : Go to step **10AZ5**.



5) Remove service hole cover located on the left rear of trunk compartment floor (Sedan) or luggage compartment floor (Wagon).

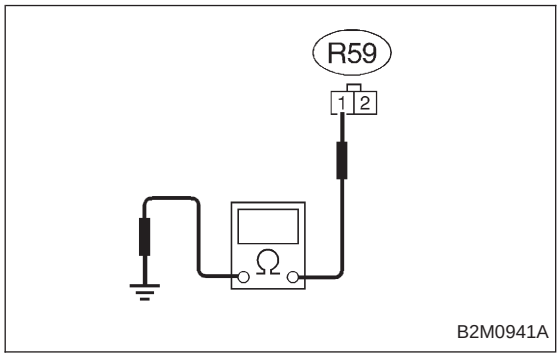


6) Disconnect connector from fuel sub meter unit.
7) Measure resistance of harness between fuel pump connector and chassis ground.

CHECK ***: Connector & terminal (R58) No. 3 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between fuel pump and fuel sub meter unit connector.

NO : Go to next step 8).

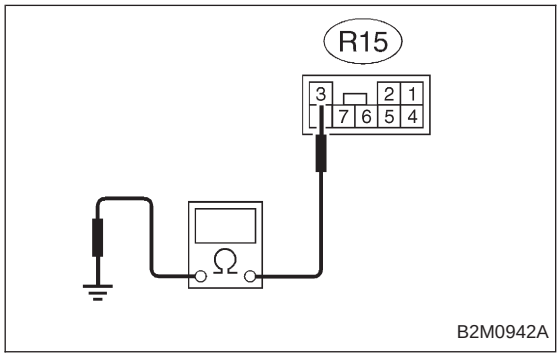


8) Separate fuel tank cord connector (R57) and rear wiring harness connector (R15).
9) Measure resistance of harness between fuel sub meter unit connector and chassis ground.

CHECK ***: Connector & terminal (R59) No. 1 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in fuel tank cord.

NO : Go to next step 10).

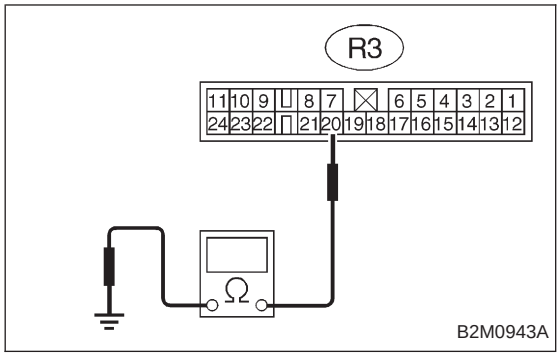


10) Separate rear wiring harness connector (R2) and bulkhead wiring harness connector (B98).
11) Measure resistance of harness between rear wiring harness connector and chassis ground.

CHECK ***: Connector & terminal (R15) No. 3 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Go to next step 12).

NO : Repair ground short circuit in bulkhead wiring harness.

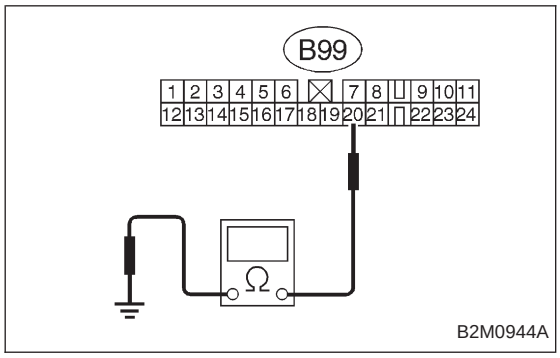


12) Separate rear wiring harness connector (R3) and bulkhead wiring harness connector (B99).
13) Measure resistance of harness between rear wiring harness connector and chassis ground.

CHECK ***: Connector & terminal (R3) No. 20 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in rear wiring harness.

NO : Go to next step 14).

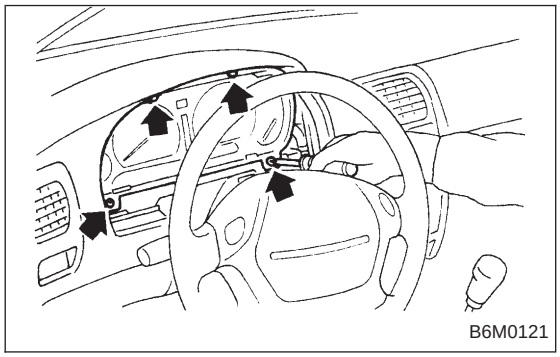


14) Separate bulkhead wiring harness connector (B38) and instrument panel wiring harness connector (i3).
15) Measure resistance of harness between bulkhead wiring harness connector and chassis ground.

CHECK ***: Connector & terminal (B99) No. 20 — Chassis ground: Is the resistance less than 10 Ω?***

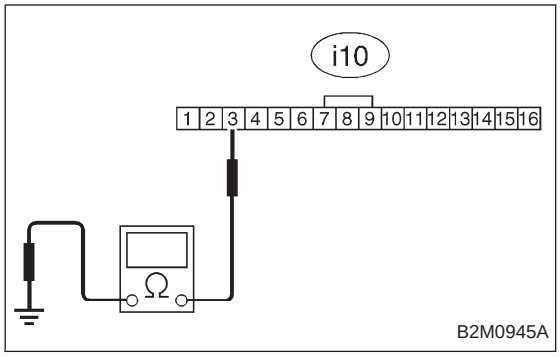
YES : Repair ground short circuit in bulkhead wiring harness.

NO : Repair ground short circuit in instrument panel wiring harness.



10AZ5	CHECK HARNESS BETWEEN COMBINATION METER AND FUEL PUMP CONNECTOR.

1) Connect connector to fuel pump.
2) Pull out combination meter from instrument panel. <Ref. to 6-2 [W13A1].>
3) Disconnect connector from combination meter.



4) Measure resistance of harness between combination meter connector and chassis ground.

CHECK ***: Connector & terminal (i10) No. 3 — Chassis ground: Is the resistance less than 200 Ω?***

YES : Go to step **10AZ6**.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between combination meter connector and junction A on rear wiring harness
- Poor contact in coupling connectors (i3 and B99)

10AZ6	CHECK COMBINATION METER.

1) Disconnect speedometer cable from combination meter and remove combination meter.

CHECK ***: Is the fuel meter installation screw tightened securely?***

YES : Go to next step 2).

NO : Tighten fuel meter installation screw securely.

2) Remove printed circuit plate assembly from combination meter assembly.

CHECK ***: Is there flaw or burning on printed circuit plate assembly?***

YES : Replace printed circuit plate assembly.

NO : Replace fuel meter assembly.

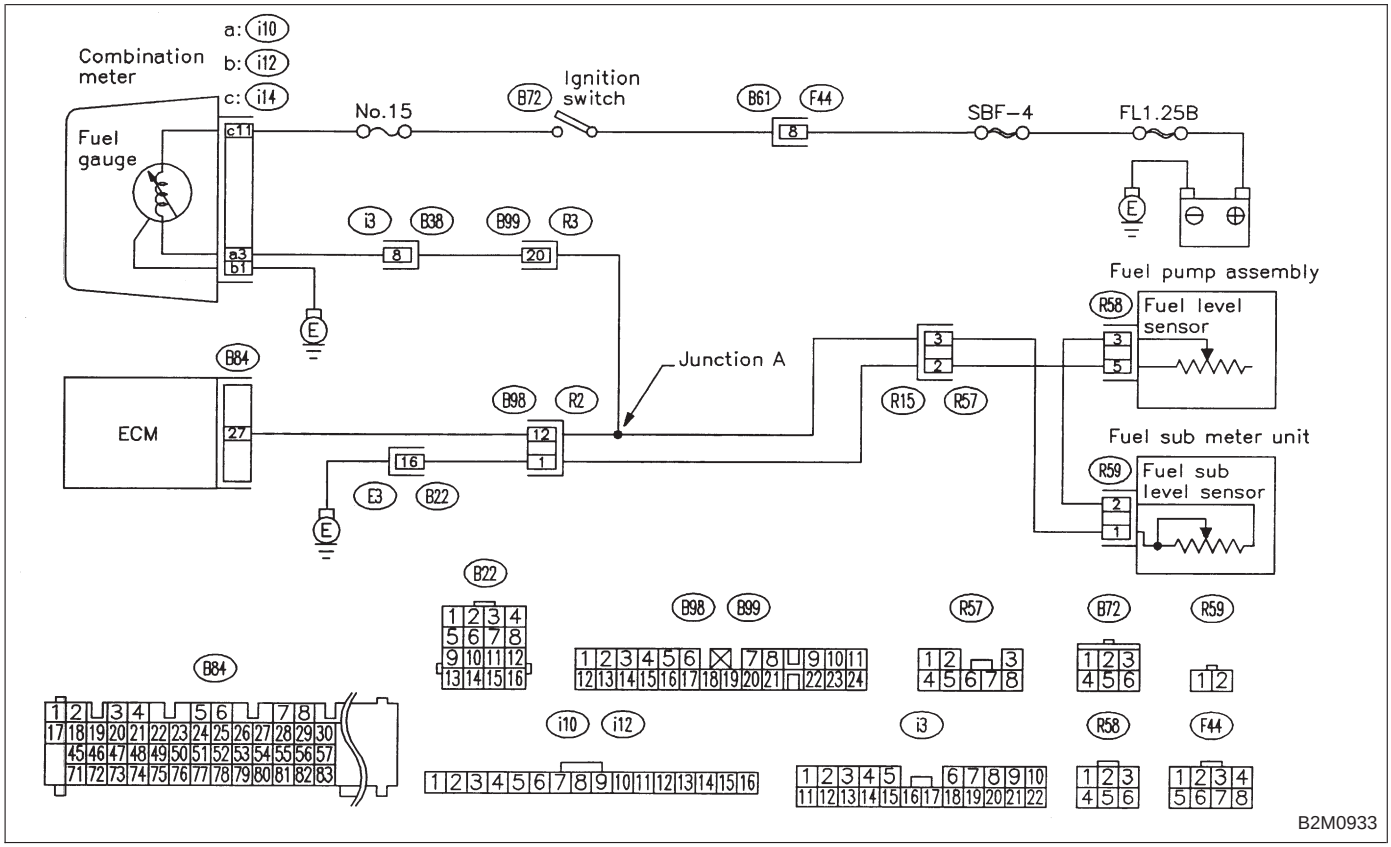
OBD (FB1)
P0463 <FLVL_HI>
B2M1103

BA: DTC P0463 — FUEL LEVEL SENSOR CIRCUIT HIGH INPUT —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



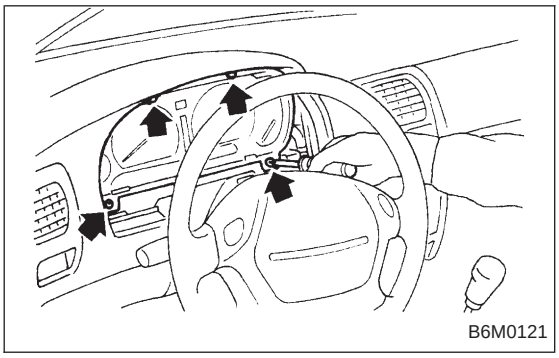
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BA1	CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.

CHECK ***: Does speedometer and tachometer operate normally?***

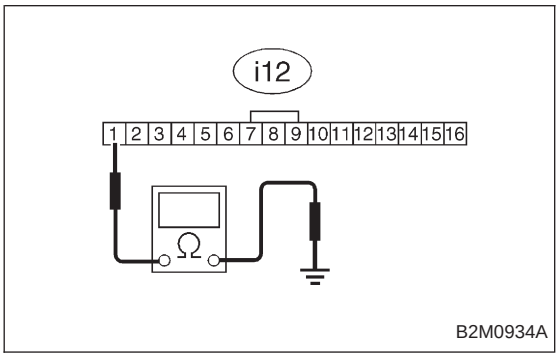
YES : Go to step **10BA3**.

NO : Go to step **10BA2**.


B6M0121

10BA2	CHECK GROUND CIRCUIT OF COMBINATION METER.

1) Turn ignition switch to OFF.
2) Pull out combination meter from instrument panel. <Ref. to 6-2 [W13A1].>
3) Disconnect connector from combination meter.



B2M0934A

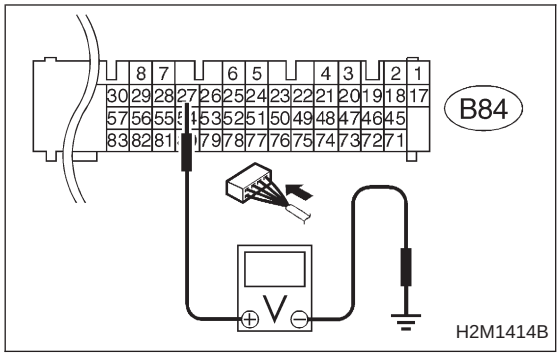
4) Measure resistance of harness between combination meter connector and chassis ground.

CHECK ***: Connector & terminal (i12) No. 1 — Chassis ground: Is resistance less than 5 Ω?***

YES : Repair or replace combination meter.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between combination meter connector and grounding terminal
- Poor contact in combination meter connector
- Poor contact in grounding terminal



10BA3	CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

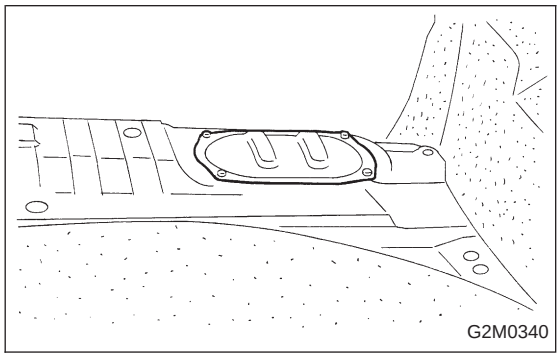
1) Turn ignition switch to ON. (Engine OFF)
2) Measure voltage between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 27 (+) — Chassis ground (−): Is the voltage more than 4.75 V?***

YES : Go to step **10BA4**.

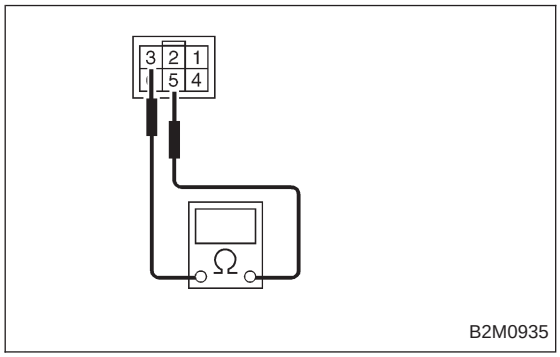
NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.

NOTE:
In this case, repair the following:
- Poor contact in fuel pump connector
- Poor contact in combination meter connector
- Poor contact in ECM connector
- Poor contact in coupling connector (i3, B99, B22, B98 and R57)



10BA4	CHECK FUEL LEVEL SENSOR.

1) Turn ignition switch to OFF.
2) Remove fuel pump access hole lid located on the right rear of trunk compartment floor (Sedan) or luggage compartment floor (Wagon).

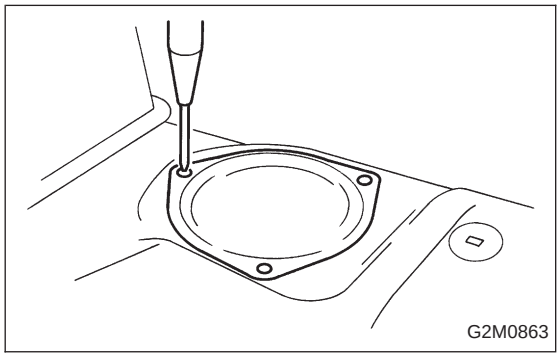


3) Disconnect connector from fuel pump.
4) Measure resistance between connector terminals of fuel pump.

CHECK ***: Terminals No. 3 — No. 5: Is the resistance less than 100 Ω?***

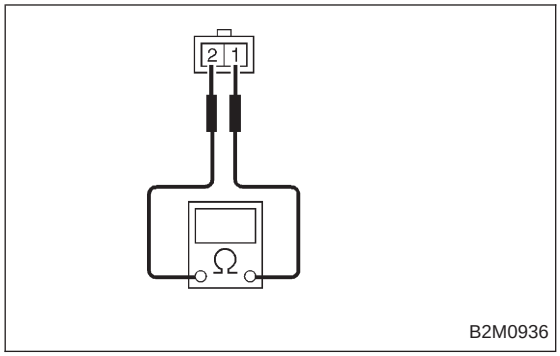
YES : Go to step **10BA5**.

NO : Replace fuel sending unit.



10BA5	CHECK FUEL SUB LEVEL SENSOR.

1) Remove service hole cover located on the left rear of trunk compartment floor (Sedan) or luggage compartment floor (Wagon).

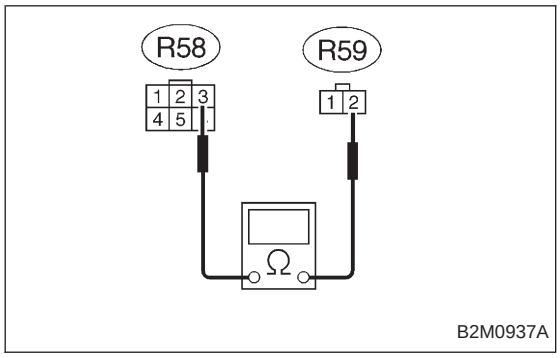


2) Disconnect connector from fuel sub meter unit.
3) Measure resistance between connector terminals of fuel sub meter unit.

CHECK ***: Terminals***
No. 1 — No. 2:
Is the resistance less than 100 Ω?

YES : Go to step **10BA6**.

NO : Replace fuel sub meter unit.



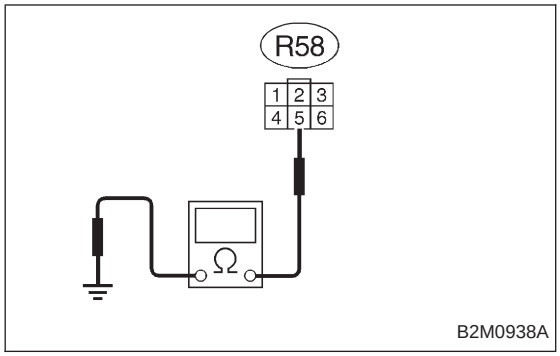
10BA6	**CHECK HARNESS BETWEEN FUEL PUMP AND FUEL SUB METER UNIT CONNECTOR.**

Measure resistance of harness between fuel pump and fuel sub meter unit connector.

CHECK ***: Connector & terminal***
(R58) No. 3 — (R59) No. 2:
Is the resistance less than 1 Ω?

YES : Go to step **10BA7**.

NO : Repair open circuit in harness between fuel pump and fuel sub meter unit connector.



10BA7	CHECK GROUND CIRCUIT OF FUEL LEVEL SENSOR.

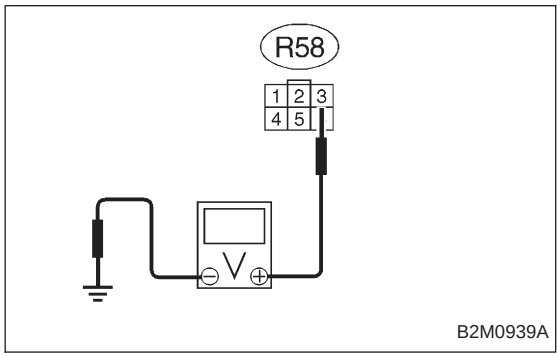
Measure resistance of harness between fuel pump connector and chassis ground.

CHECK ***: Connector & terminal (R58) No. 5 — Chassis ground: Is the resistance less than 5 Ω?***

YES : Go to step **10BA8**.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between fuel pump connector and chassis grounding terminal
- Poor contact in fuel pump connector
- Poor contact in coupling connectors (R57, B98 and B22)



10BA8	CHECK HARNESS BETWEEN ECM AND FUEL PUMP CONNECTOR.

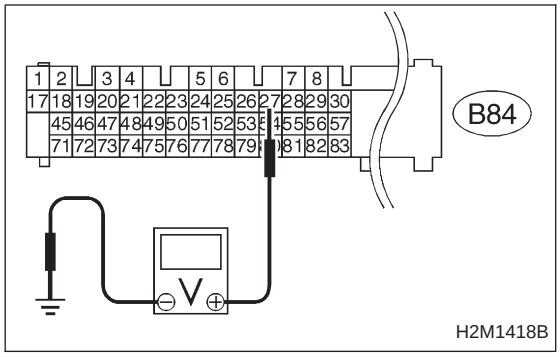
1) Connect connector to fuel sub meter unit.
2) Turn ignition switch to ON.
3) Measure voltage between fuel pump connector and chassis ground.

CHECK ***: Connector & terminal (R58) No. 3 (+) — Chassis ground (−): Is the voltage less than 1 V?***

YES : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between fuel pump connector and junction A on rear wiring harness
- Poor contact in fuel sub meter unit connector
- Poor contact in fuel pump connector
- Poor contact in coupling connector (R57)

NO : Go to next step 4).



4) Turn ignition switch to OFF.
5) Disconnect connector from ECM.
6) Turn ignition switch to ON.
7) Measure voltage between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 27 (+) — Chassis ground: Is the voltage less than 1 V?***

YES : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM connector and junction A on rear wiring harness
- Poor contact in coupling connector (B98)

NO : Repair connector.

NOTE:
In this case, repair the following:
- Poor contact in fuel pump connector
- Poor contact in fuel sub meter unit
- Poor contact in ECM connector

OBD (FB1)

P0500 <VSP>

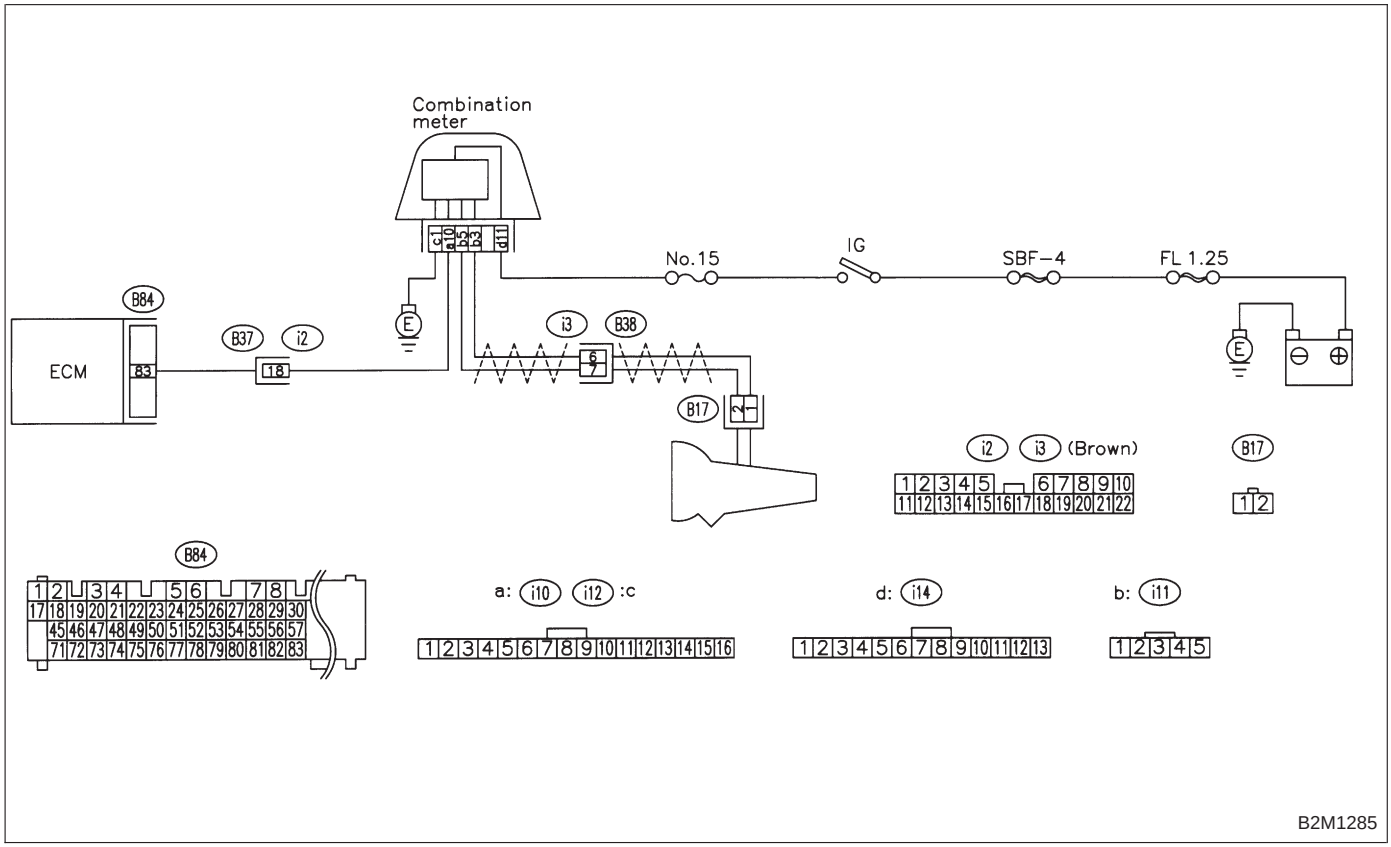
OBD0340

BB: DTC P0500 — VEHICLE SPEED SENSOR MALFUNCTION —

DTC DETECTING CONDITION:

- Immediately at fault recognition

WIRING DIAGRAM:



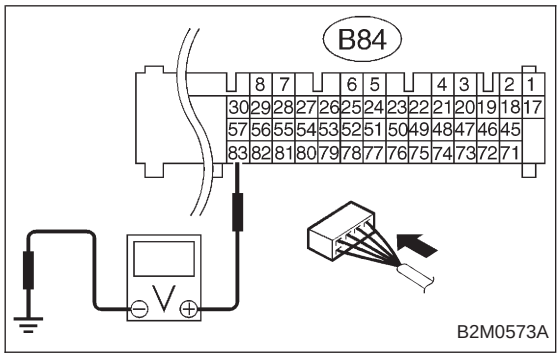
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BB1	CHECK SPEEDOMETER OPERATION IN COMBINATION METER.

CHECK ***: Does speedometer operate normally?***

YES : Go to step **10BB2**.

NO : Check speedometer and vehicle speed sensor <Ref. to 6-2 [K3A0].>.



10BB2	CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.

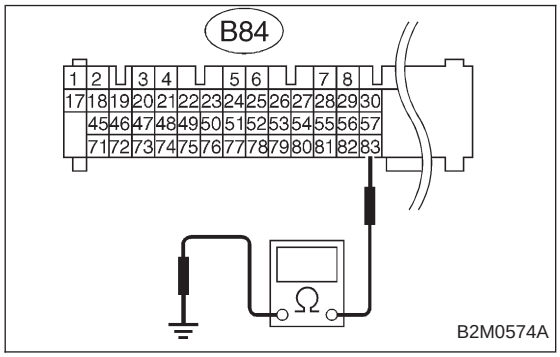
1) Turn ignition switch to OFF.
2) Disconnect connector from TCM.
3) Turn ignition switch to ON.
4) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal***
(B84) No. 83 (+) — Chassis ground (−):
Is the voltage more than 2 V?

YES : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and combination meter connector
- Poor contact in ECM connector
- Poor contact in combination meter connector
- Poor contact in coupling connector (B37)

NO : Go to step **10BB3**.



10BB3	CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from ECM.
3) Measure resistance of harness between ECM connector and chassis ground.

CHECK ***: Connector & terminal***
(B84) No. 83 — Chassis ground:
Is the resistance less than 10 Ω?

YES : Repair ground short circuit in harness between ECM and combination meter connector.

NO : Repair poor contact in ECM connector.

OBD	(FB1)
P0505	<ISC>

OBD0358

BC: DTC P0505 — IDLE CONTROL SYSTEM MALFUNCTION —

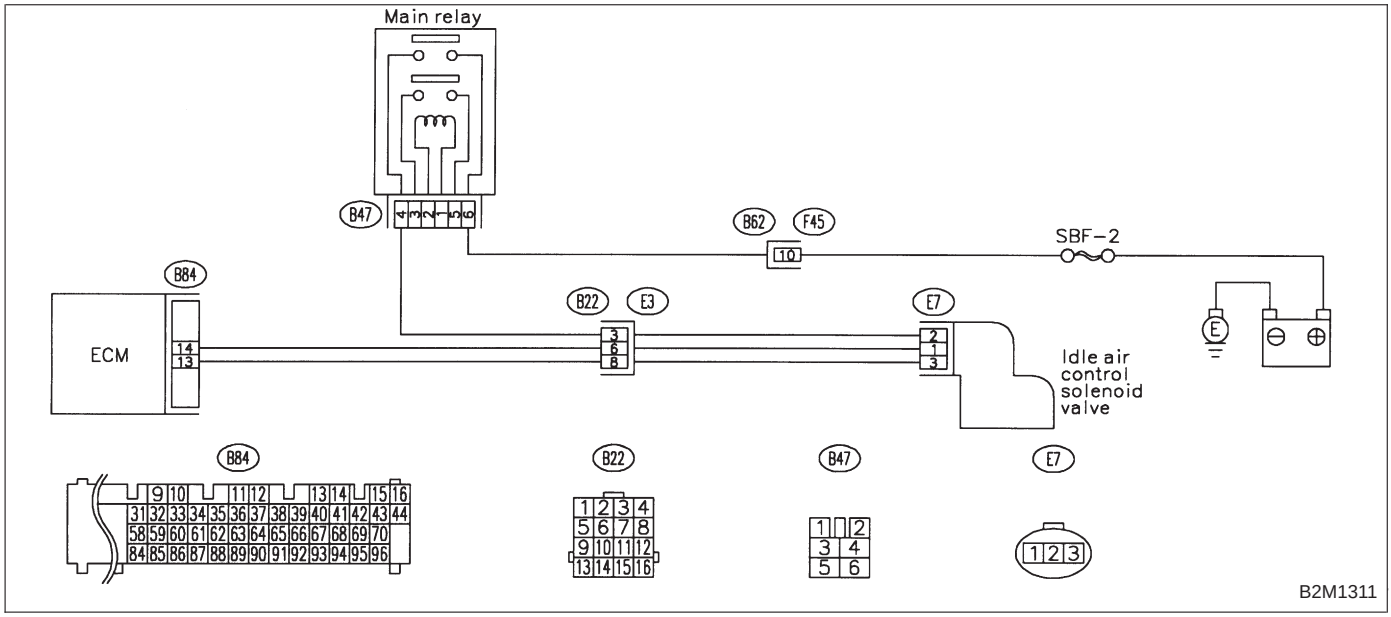
DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Engine breathing

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

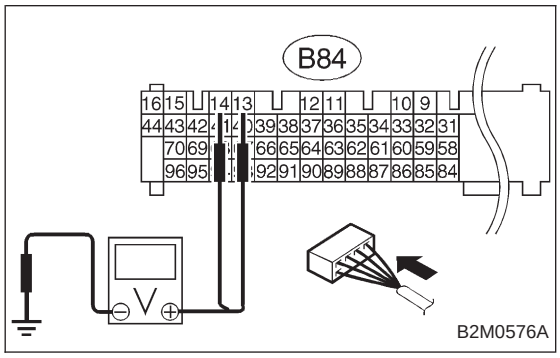
10BC1	CHECK AIR INTAKE SYSTEM.

1) Turn ignition switch to ON.
2) Start engine, and idle it.

CHECK ***: Is there a fault in air intake system?***

NOTE:
Check the following items.
- Loose installation of intake manifold, idle air control solenoid valve and throttle body
- Cracks of intake manifold gasket, idle air control solenoid valve gasket and throttle body gasket
- Loose connections and cracks of idle air control solenoid valve by-pass hoses
- Disconnections of vacuum hoses

YES : Repair or replace air intake system.
NO : Go to step **10BC2**.



10BC2	CHECK OUTPUT SIGNAL FROM ECM.

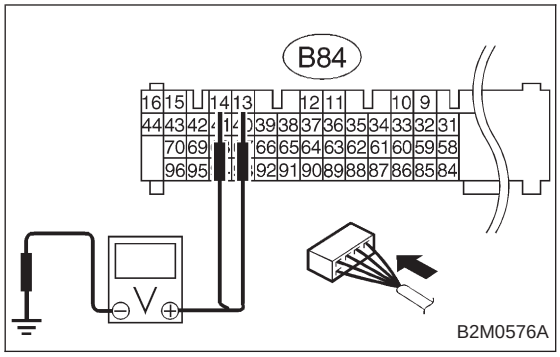
1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 13 (+) — Chassis ground (−): Is the voltage more than 3 V?***

YES : Go to next CHECK .
NO : Go to step **10BC4**.

CHECK ***: Connector & terminal (B84) No. 14 (+) — Chassis ground (−): Is the voltage more than 3 V?***

YES : Go to next step 3).
NO : Go to step **10BC4**.



3) Turn ignition switch to OFF.
4) Disconnect connector from idle air control solenoid valve.
5) Turn ignition switch to ON.
6) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 13 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and idle air control solenoid valve connector. After repair, replace ECM.

NO : Go to next CHECK .

CHECK ***: Connector & terminal (B84) No. 14 (+) — Chassis ground (−): Is the voltage more than 10 V?***

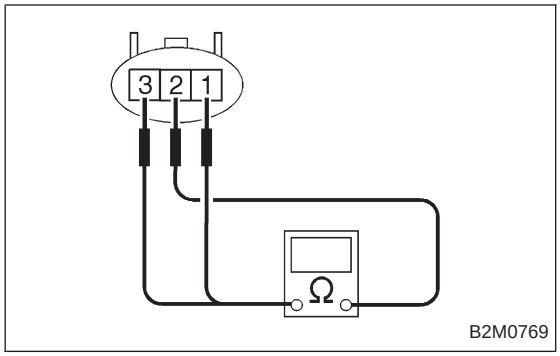
YES : Repair battery short circuit in harness between ECM and idle air control solenoid valve connector. After repair, replace ECM.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

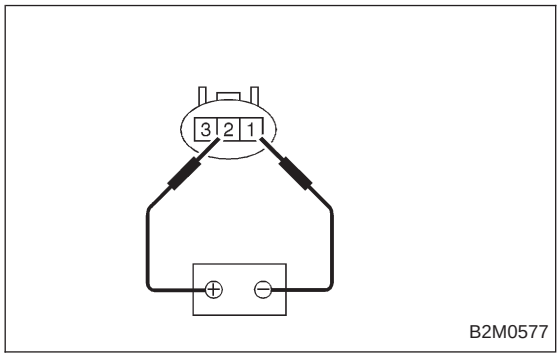
NO : Go to step **10BC3**.



10BC3	CHECK IDLE AIR CONTROL SOLENOID VALVE.

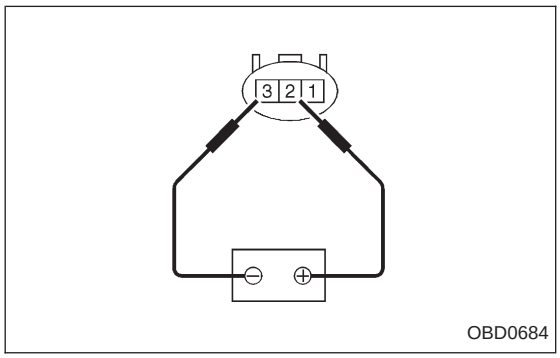
1) Turn ignition switch to OFF.
2) Measure resistance between idle air control solenoid valve connector terminals.

CHECK ***: Terminals No. 1 — No. 2: Is the resistance more than 20 Ω?***
YES : Replace idle air control solenoid valve.
NO : Go to next CHECK .
CHECK ***: Terminals No. 2 — No. 3: Is the resistance more than 20 Ω?***
YES : Replace idle air control solenoid valve.
NO : Go to next CHECK .
CHECK ***: Terminals No. 1 — No. 2: Is the resistance less than 5 Ω?***
YES : Replace idle air control solenoid valve and ECM.
NO : Go to next CHECK .
CHECK ***: Terminals No. 2 — No. 3: Is the resistance less than 5 Ω?***
YES : Replace idle air control solenoid valve and ECM.
NO : Go to next step 3).

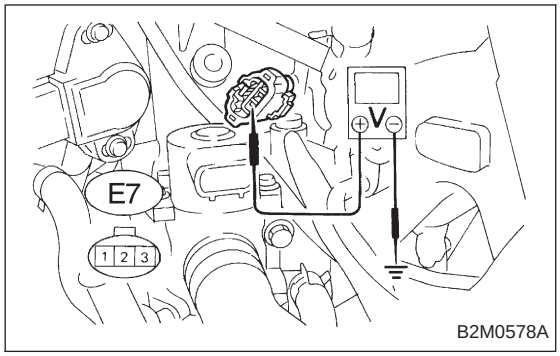


3) Remove idle air control solenoid valve. <Ref. to 2-7 [W12A0].>
4) Check operation of idle air control solenoid valve.

CHECK ***: Is idle air control solenoid valve fully opened when applying the battery to terminals No. 2 (+) and No. 1 (−)?***
YES : Go to next CHECK .
NO : Clean idle air control solenoid valve. <Ref. to 2-7 [W12B0].>



CHECK ***: Is idle air control solenoid valve fully closed when applying the battery to terminals No. 2 (+) and No. 3 (−)?***
YES : Go to step **10BC4**.
NO : Clean idle air control solenoid valve. <Ref. to 2-7 [W12B0].>



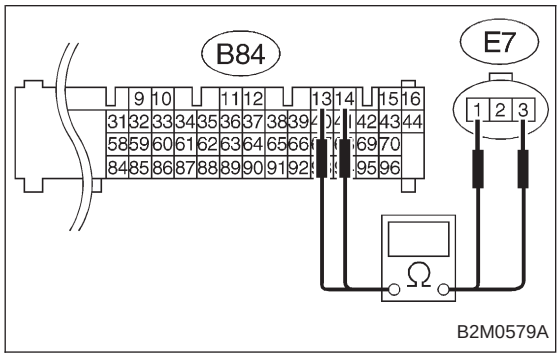
10BC4	CHECK POWER SUPPLY TO IDLE AIR CONTROL SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Disconnect connector from idle air control solenoid valve.
3) Turn ignition switch to ON.
4) Measure voltage between idle air control solenoid valve and engine ground.

CHECK ***: Connector & terminal***
(E7) No. 2 (+) — Engine ground (−):
Is the voltage more than 10 V?

YES : Go to step **10BC5**.

NO : Repair open circuit in harness between idle air control solenoid valve and main relay connector.



10BC5	CHECK HARNESS BETWEEN ECM AND IDLE AIR CONTROL SOLENOID VALVE CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from ECM.
3) Measure resistance of harness between ECM and idle air control solenoid valve connector.

CHECK ***: Connector & terminal***
(B84) No. 14 — (E7) No. 1:
Is the resistance less than 1 Ω?

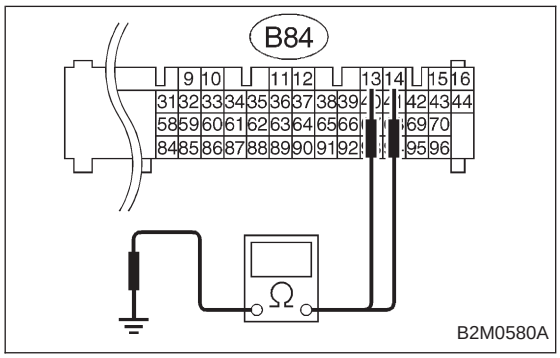
YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM and idle air control solenoid valve connector.

CHECK ***: Connector & terminal***
(B84) No. 13 — (E7) No. 3:
Is the resistance less than 1 Ω?

YES : Go to next step 4).

NO : Repair open circuit in harness between ECM and idle air control solenoid valve connector.



4) Measure resistance of harness between ECM and chassis ground.

CHECK ***: Connector & terminal***
(B84) No. 13 — Chassis ground:
Is the resistance less than 10 Ω?

YES : Repair ground short circuit in harness between ECM and idle air control solenoid valve connector.

NO : Go to next CHECK .

CHECK ***: Connector & terminal (B84) No. 14 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between ECM and idle air control solenoid valve connector.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in idle air control solenoid valve connector?***

YES : Repair poor contact in idle air control solenoid valve connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

OBD (FB1)

P0506 <ISC_RLOW>

B2M1104

BD: DTC P0506 — IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED —

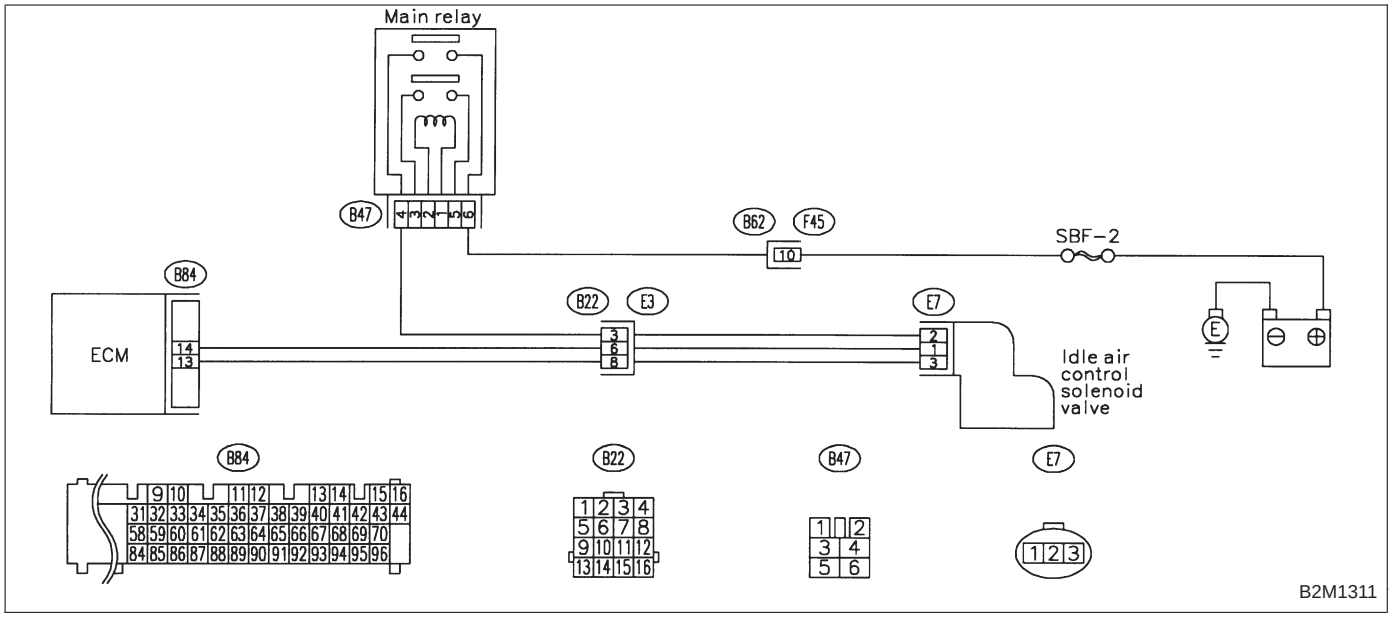
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Engine is difficult to start.
- Engine does not start.
- Erroneous idling
- Engine stalls.

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BD1	CHECK DTC P0505 ON DISPLAY.

CHECK : ***Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0505?***

YES : Inspect DTC P0505 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect DTC P0506.

NO : Go to step **10BD2**.

10BD2	CHECK AIR INTAKE SYSTEM.

1) Turn ignition switch to ON.
2) Start engine, and idle it.

CHECK : ***Is clogging the by-pass line between by-pass hose and intake duct?***

YES : Repair the by-pass line.

NO : Replace idle air control solenoid valve.

OBD (FB1)
P0507 <ISC_RHI>
B2M1105

BE: DTC P0507 — IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED —

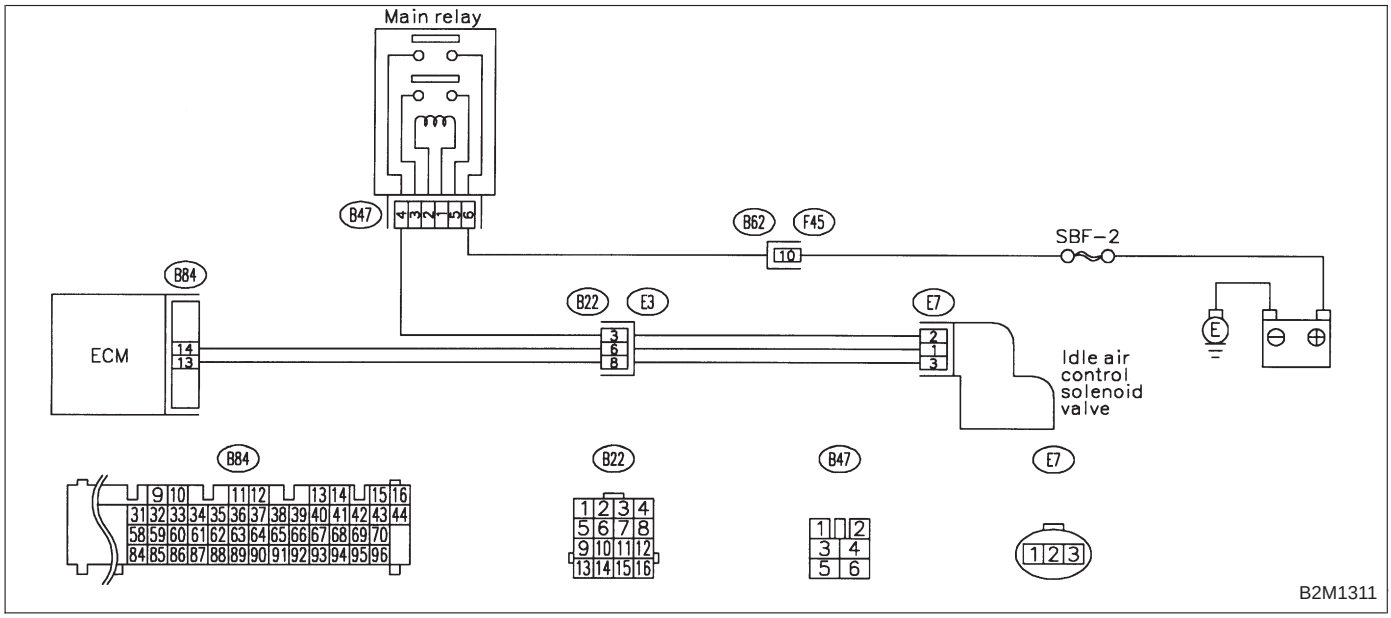
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Engine keeps running at higher revolution than specified idling revolution.

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BE1	CHECK DTC P0505 ON DISPLAY.

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0505?***

YES : Inspect DTC P0505 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect DTC P0507.

NO : Go to step **10BE2**.

10BE2	CHECK AIR INTAKE SYSTEM.

1) Turn ignition switch to ON.
2) Start engine, and idle it.

CHECK ***: Is there a fault in air intake system?***

NOTE:
Check the following items.
- Loose installation of intake manifold, idle air control solenoid valve and throttle body
- Cracks of intake manifold gasket, idle air control solenoid valve gasket and throttle body gasket
- Loose connections and cracks of idle air control solenoid valve by-pass hoses
- Disconnections of vacuum hoses

YES : Repair air suction and leaks.

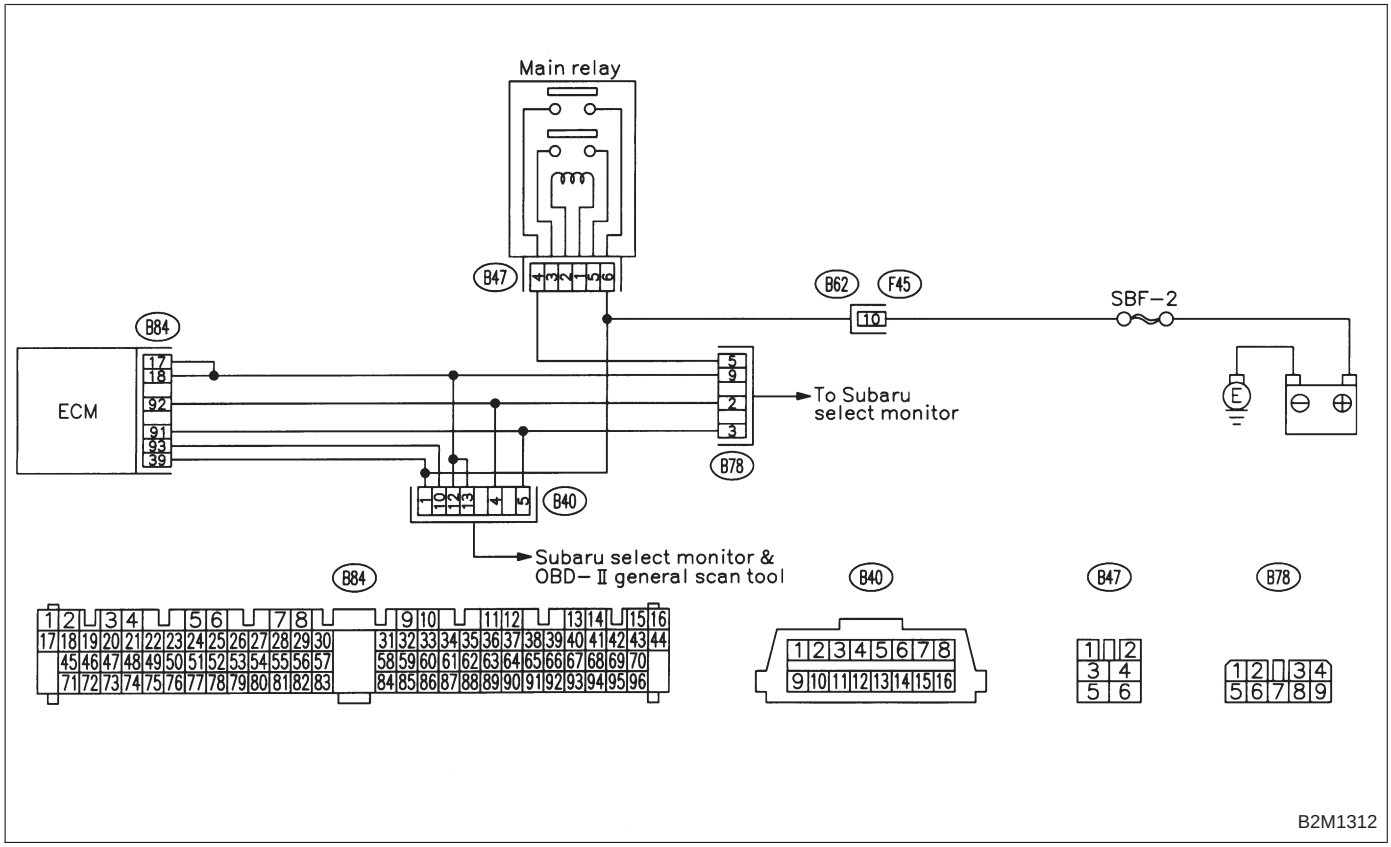
NO : Replace idle air control solenoid valve.

BF: DTC P0600 — SERIAL COMMUNICATION LINK MALFUNCTION —

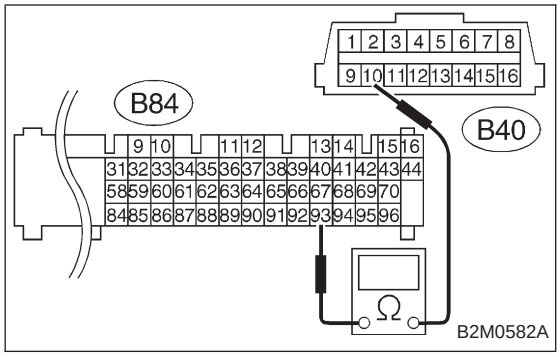
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



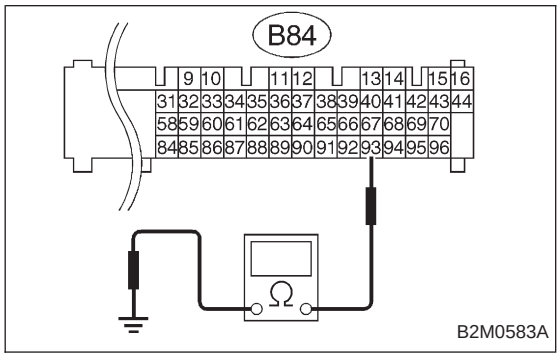
10BF1	CHECK HARNESS BETWEEN ECM AND DATA LINK CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from ECM.
3) Measure resistance of harness between ECM and data link connector (for Subaru Select Monitor & OBD-II general scan tool).

CHECK ***: Connector & terminal (B84) No. 93 — (B40) No. 10: Is the resistance less than 1 Ω?***

YES : Go to next step 4).

NO : Repair open circuit in harness between ECM and data link connector.



4) Measure resistance of harness between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 93 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between ECM and data link connector.

NO : Repair poor contact in ECM connector and data link connector.

OBD	(FB1)
P0601	<RAM>

OBD0376

BG: DTC P0601 — INTERNAL CONTROL MODULE MEMORY CHECK SUM ERROR —

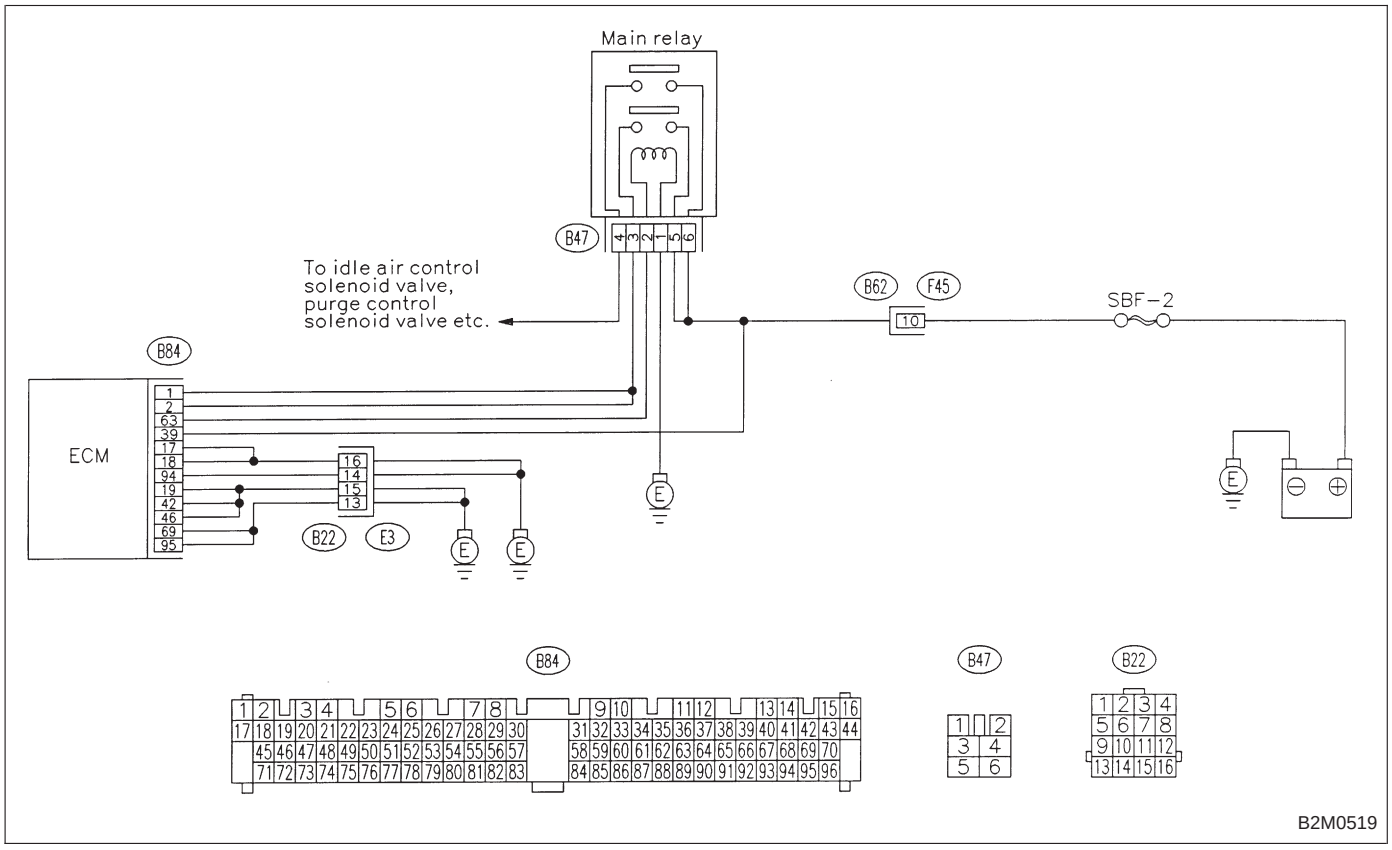
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Engine does not start.
- Engine stalls.

WIRING DIAGRAM:



B2M0519

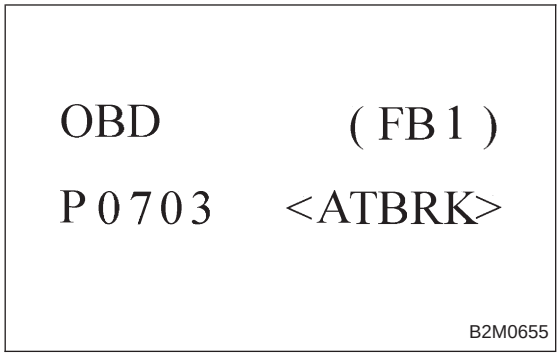
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BG1	CHECK DTC P0601 ON DISPLAY.

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0601?***

YES : Replace ECM.

NO : It is not necessary to inspect DTC P0601.

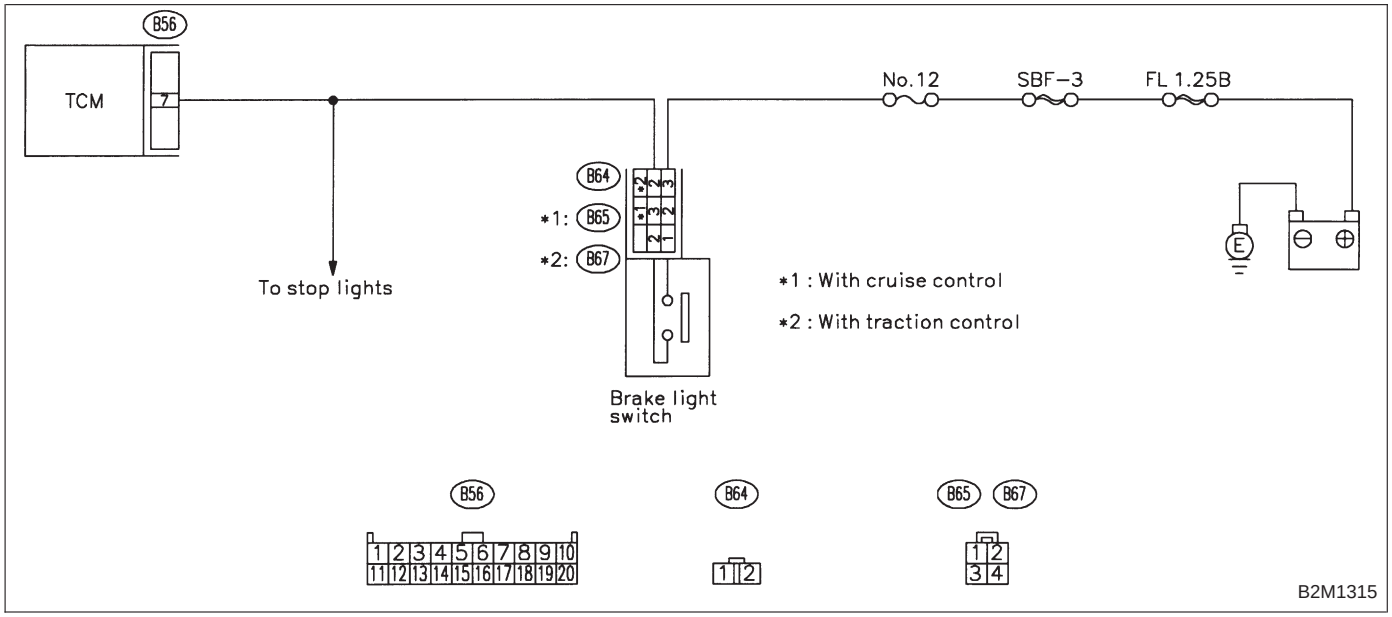


BH: DTC P0703
— BRAKE SWITCH INPUT MALFUNCTION —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



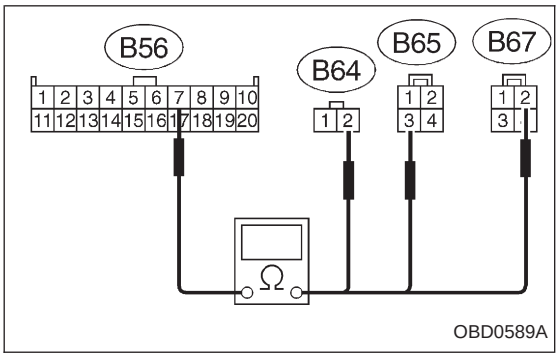
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BH1	CHECK OPERATION OF BRAKE LIGHT.

CHECK : ***Does brake light come on when depressing the brake pedal?***

YES : Go to step **10BH2**.

NO : Repair or replace brake light circuit.



10BH2	CHECK HARNESS BETWEEN TCM AND BRAKE LIGHT SWITCH CONNECTOR.

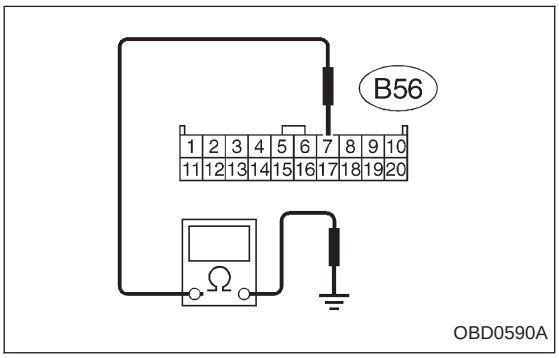
1) Disconnect connectors from TCM and brake light switch.
2) Measure resistance of harness between TCM and brake light switch connector.

CHECK : ***Connector & terminal***
(B56) No. 7 — (B64) No. 2:
(B56) No. 7 — (B65) No. 3 (With cruise control):
(B56) No. 7 — (B67) No. 2 (With traction control):
Is the resistance less than 1 Ω?

YES : Go to next step 3).

NO : Repair or replace harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and brake light switch connector
- Poor contact in TCM connector
- Poor contact in brake light switch connector

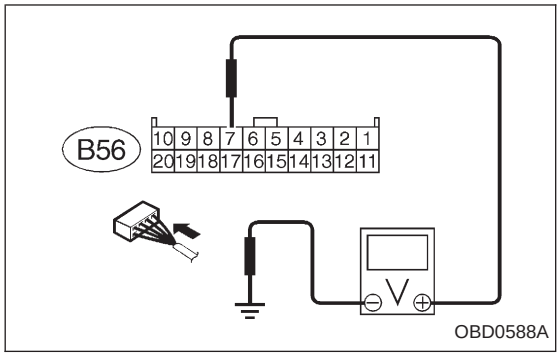


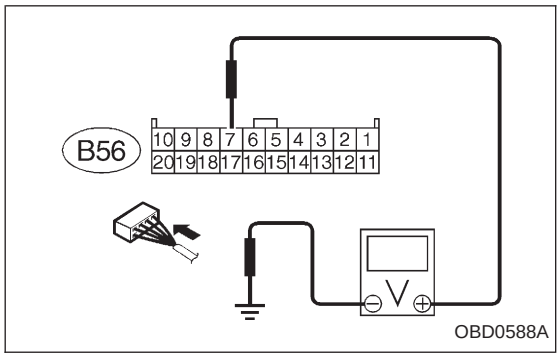
3) Measure resistance of harness between TCM and chassis ground.

CHECK : ***Connector & terminal***
(B56) No. 7 — Chassis ground:
Is the resistance more than 1 MΩ?

YES : Go to step **10BH3**.

NO : Repair ground short circuit in harness between TCM and brake light switch connector.





10BH3	CHECK INPUT SIGNAL FOR TCM.

1) Connect connectors to TCM and brake light switch.
2) Measure voltage between TCM and chassis ground.

CHECK ***: Connector & terminal (B56) No. 7 (+) — Chassis ground (−): Is the voltage less than 1 V when releasing the brake pedal?***

YES : Go to next CHECK .

NO : Adjust or replace brake light switch.

CHECK ***: Connector & terminal (B56) No. 7 (+) — Chassis ground (−): Is the voltage more than 10 V when depressing the brake pedal?***

YES : Go to next CHECK .

NO : Adjust or replace brake light switch.

CHECK ***: Is there poor contact in TCM connector?***

YES : Repair poor contact in TCM connector.

NO : Replace TCM.

OBD (FB1)

P0705 <ATRNG>

B2M0656

BI: DTC P0705 — TRANSMISSION RANGE SENSOR CIRCUIT MALFUNCTION —

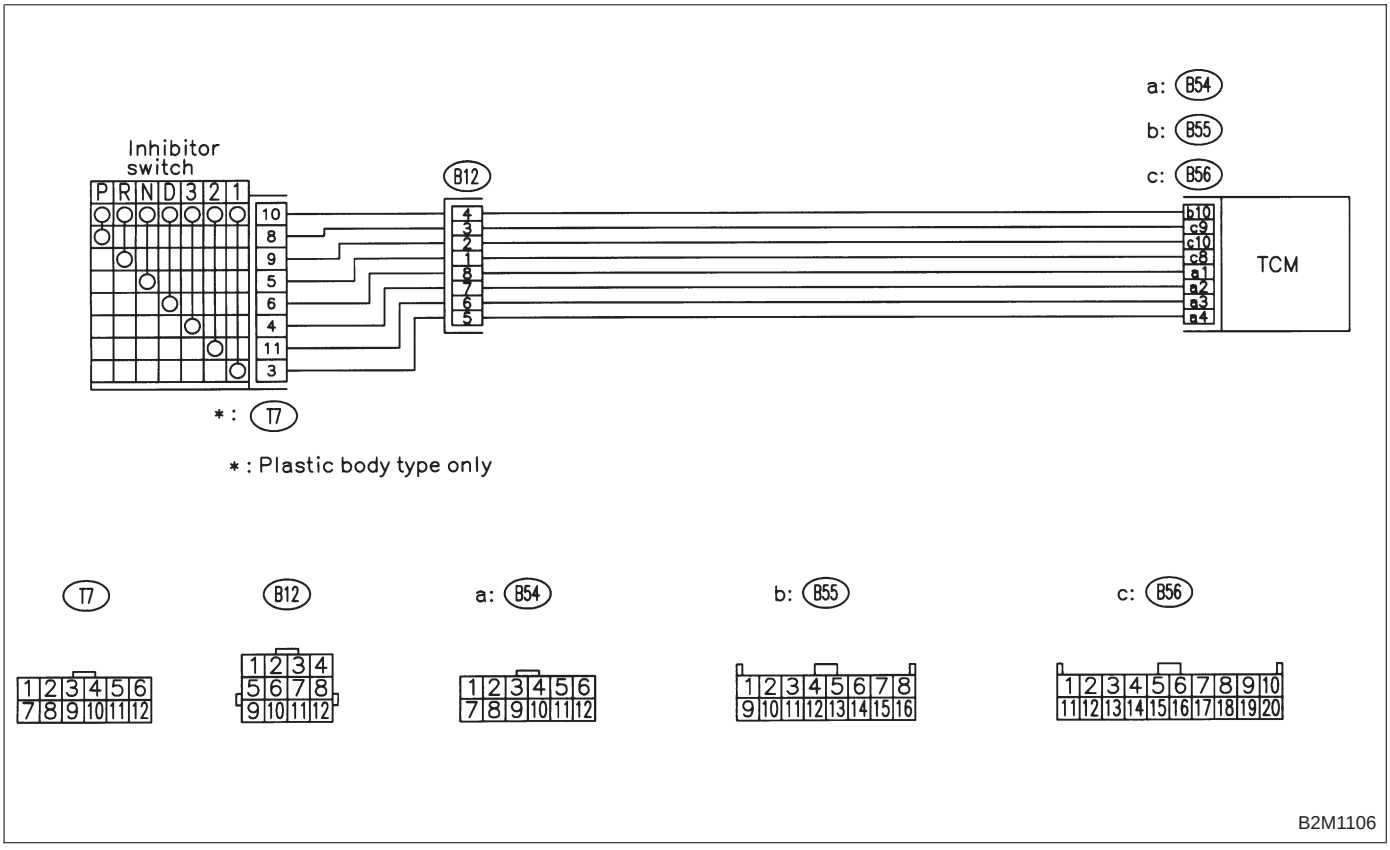
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Starter does not rotate when selector lever is in “P” or “N” range.
- Starter rotates when selector lever is in “R”, “D”, “3”, “2” or “1” range.
- Engine brake is not effected when selector lever is in “3” range.
- Shift characteristics are erroneous.

WIRING DIAGRAM:

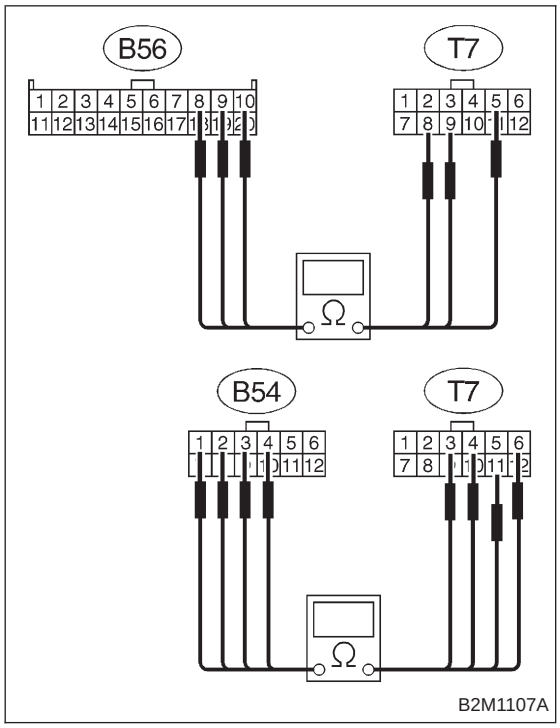


B2M1106

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BI1	CHECK INHIBITOR SWITCH TYPE.

CHECK ***: Is inhibitor switch type plastic body?***
YES : Go to step **10BI2**.
NO : Go to step **10BI4**.



10BI2	CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connectors from TCM and transmission.
3) Measure resistance of harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal***
(B56) No. 9 — (T7) No. 8:
Is the resistance less than 1 Ω?

YES : Go to next CHECK .
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and inhibitor switch connector
- Poor contact in coupling connector (B12)

CHECK ***: Connector & terminal***
(B56) No. 10 — (T7) No. 9:
Is the resistance less than 1 Ω?

YES : Go to next CHECK .
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and inhibitor switch connector
- Poor contact in coupling connector (B12)

CHECK ***: Connector & terminal***
(B56) No. 8 — (T7) No. 5:
Is the resistance less than 1 Ω?

YES : Go to next CHECK .
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and inhibitor switch connector.
- Poor contact in coupling connector (B12)

CHECK ***: Connector & terminal (B54) No. 1 — (T7) No. 6: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and inhibitor switch connector
- Poor contact in coupling connector (B12)

CHECK ***: Connector & terminal (B54) No. 2 — (T7) No. 4: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and inhibitor switch connector
- Poor contact in coupling connector (B12)

CHECK ***: Connector & terminal (B54) No. 3 — (T7) No. 11: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair harness and connector.

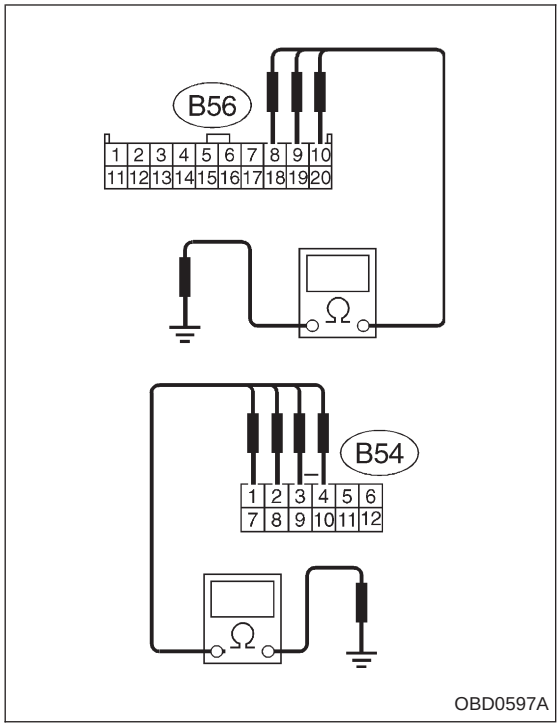
NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and inhibitor switch connector
- Poor contact in coupling connector (B12)

CHECK ***: Connector & terminal (B54) No. 4 — (T7) No. 3: Is the resistance less than 1 Ω?***

YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and inhibitor switch connector
- Poor contact in coupling connector (B12)



4) Measure resistance of harness between TCM and chassis ground.

CHECK ***: Connector & terminal (B56) No. 9 — Chassis ground: Is the resistance more than 1 MΩ?***

YES : Go to next CHECK .

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal (B56) No. 10 — Chassis ground: Is the resistance more than 1 MΩ?***

YES : Go to next CHECK .

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal (B56) No. 8 — Chassis ground: Is the resistance more than 1 MΩ?***

YES : Go to next CHECK .

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal (B54) No. 1 — Chassis ground: Is the resistance more than 1 MΩ?***

YES : Go to next CHECK .

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal (B54) No. 2 — Chassis ground: Is the resistance more than 1 MΩ?***

YES : Go to next CHECK .

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal (B54) No. 3 — Chassis ground: Is the resistance more than 1 MΩ?***

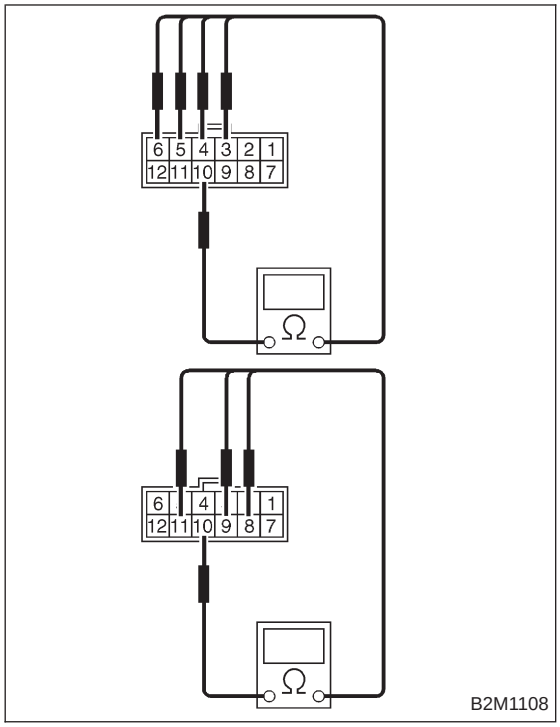
YES : Go to next CHECK .

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal (B54) No. 4 — Chassis ground: Is the resistance more than 1 MΩ?***

YES : Go to step **10BI3**.

NO : Repair ground short circuit in harness between TCM and transmission harness connector.



10BI3	CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

CHECK : ***Terminals***
No. 8 — No. 10
- ***Is the resistance less than 1 Ω in "P" position?***
- ***Is the resistance more than 1 MΩ in other positions?***

YES : Go to next CHECK .
NO : Go to CHECK1 .

CHECK : ***Terminals***
No. 9 — No. 10
- ***Is the resistance less than 1 Ω in "R" position?***
- ***Is the resistance more than 1 MΩ in other positions?***

YES : Go to next CHECK .
NO : Go to CHECK1 .

CHECK : ***Terminals***
No. 5 — No. 10
- ***Is the resistance less than 1 Ω in "N" position?***
- ***Is the resistance more than 1 MΩ in other positions?***

YES : Go to next CHECK .
NO : Go to CHECK1 .

CHECK : ***Terminals***
No. 6 — No. 10
- ***Is the resistance less than 1 Ω in "D" position?***
- ***Is the resistance more than 1 MΩ in other positions?***

YES : Go to next CHECK .
NO : Go to CHECK1 .

CHECK : ***Terminals***
No. 4 — No. 10
- ***Is the resistance less than 1 Ω in "3" position?***
- ***Is the resistance more than 1 MΩ in other positions?***

YES : Go to next CHECK .
NO : Go to CHECK1 .

CHECK ***: Terminals***
No. 11 — No. 10
● Is the resistance less than 1 Ω in "2" position?
● Is the resistance more than 1 MΩ in other positions?

YES : Go to next CHECK .

NO : Go to CHECK1 .

CHECK ***: Terminals***
No. 3 — No. 10
● Is the resistance less than 1 Ω in "1" position?
● Is the resistance more than 1 MΩ in other positions?

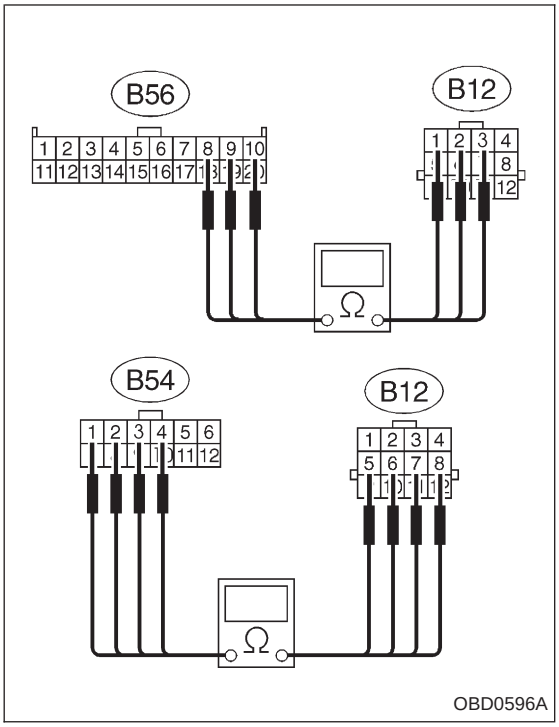
YES : Go to step **10BI6**.

NO : Go to CHECK1 .

CHECK1 ***: Is there faulty connection in the selector cable?***

YES : Repair connection of selector cable.

NO : Replace inhibitor switch.



10BI4	CHECK HARNESS BETWEEN TCM AND TRANSMISSION HARNESS CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connectors from TCM and transmission harness connector.
3) Measure resistance of harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal (B56) No. 9 — (B12) No. 3: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal (B56) No. 10 — (B12) No. 2: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal (B56) No. 8 — (B12) No. 1: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal (B54) No. 1 — (B12) No. 8: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal (B54) No. 2 — (B12) No. 7: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal (B54) No. 3 — (B12) No. 6: Is the resistance less than 1 Ω?***

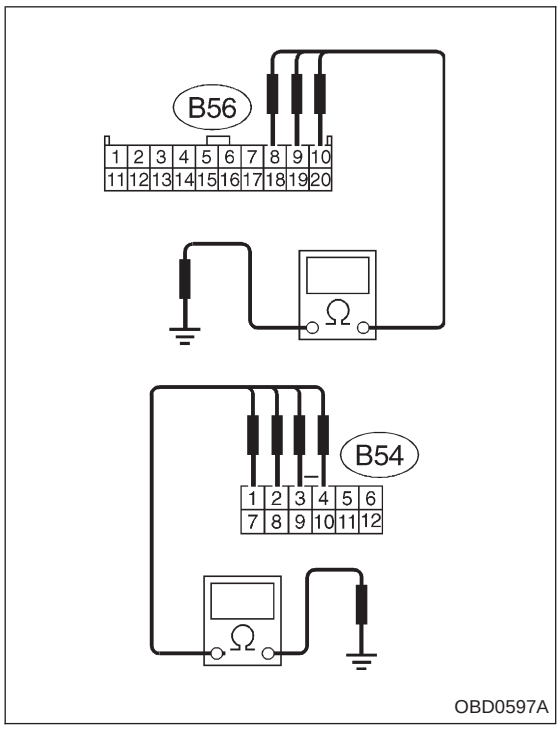
YES : Go to next CHECK .

NO : Repair open circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal***
(B54) No. 4 — (B12) No. 5:
Is the resistance less than 1 Ω?

YES : Go to next step 4).

NO : Repair open circuit in harness between TCM and transmission harness connector.



4) Measure resistance of harness between TCM and chassis ground.

CHECK ***: Connector & terminal***
(B56) No. 9 — Chassis ground:
Is the resistance more than 1 MΩ?

YES : Go to next CHECK .

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal***
(B56) No. 10 — Chassis ground:
Is the resistance more than 1 MΩ?

YES : Go to next CHECK .

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal***
(B56) No. 8 — Chassis ground:
Is the resistance more than 1 MΩ?

YES : Go to next CHECK .

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal***
(B54) No. 1 — Chassis ground:
Is the resistance more than 1 MΩ?

YES : Go to next CHECK .

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal***
(B54) No. 2 — Chassis ground:
Is the resistance more than 1 MΩ?

YES : Go to next CHECK .

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal***
(B54) No. 3 — Chassis ground:
Is the resistance more than 1 MΩ?

YES : Go to next CHECK .

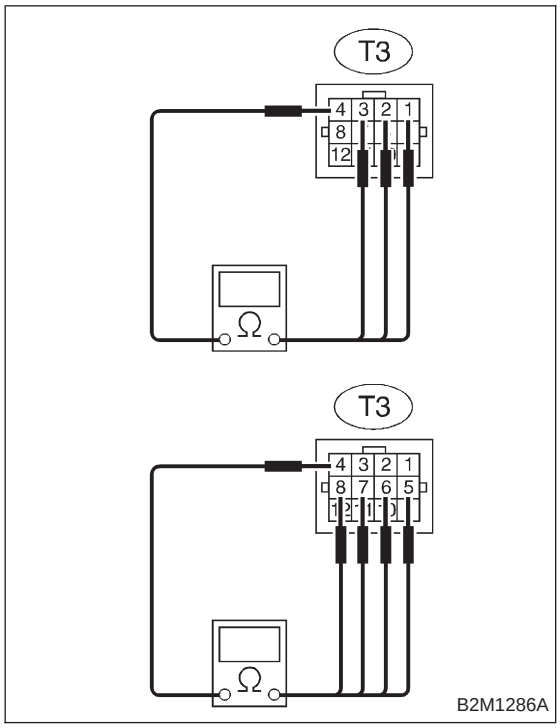
NO : Repair ground short circuit in harness between TCM and transmission harness connector.

CHECK ***: Connector & terminal***

(B54) No. 4 — Chassis ground:
Is the resistance more than 1 MΩ?

YES : Go to step **10BI5**.

NO : Repair ground short circuit in harness between TCM and transmission harness connector.



10BI5	CHECK INHIBITOR SWITCH.

Measure resistance between transmission harness connector receptacle's terminals.

CHECK ***: Connector & terminal***
(T3) No. 3 — No. 4
- ***Is the resistance less than 1 Ω in "P" position?***
- ***Is the resistance more than 1 MΩ in other positions?***

YES : Go to next CHECK .

NO : Go to CHECK1 .

CHECK ***: Connector & terminal***
(T3) No. 2 — No. 4
- ***Is the resistance less than 1 Ω in "R" position?***
- ***Is the resistance more than 1 MΩ in other positions?***

YES : Go to next CHECK .

NO : Go to CHECK1 .

CHECK ***: Connector & terminal***
(T3) No. 1 — No. 4
- ***Is the resistance less than 1 Ω in "N" position?***
- ***Is the resistance more than 1 MΩ in other positions?***

YES : Go to next CHECK .

NO : Go to CHECK1 .

CHECK ***: Connector & terminal***
(T3) No. 8 — No. 4
- ***Is the resistance less than 1 Ω in "D" position?***
- ***Is the resistance more than 1 MΩ in other positions?***

YES : Go to next CHECK .

NO : Go to CHECK1 .

CHECK ***: Connector & terminal (T3) No. 7 — No. 4***
● Is the resistance less than 1 Ω in "3" position?
● Is the resistance more than 1 MΩ in other positions?

YES : Go to next CHECK .

NO : Go to CHECK1 .

CHECK ***: Connector & terminal (T3) No. 6 — No. 4***
● Is the resistance less than 1 Ω in "2" position?
● Is the resistance more than 1 MΩ in other positions?

YES : Go to next CHECK .

NO : Go to CHECK1 .

CHECK ***: Connector & terminal (T3) No. 5 — No. 4***
● Is the resistance less than 1 Ω in "1" position?
● Is the resistance more than 1 MΩ in other positions?

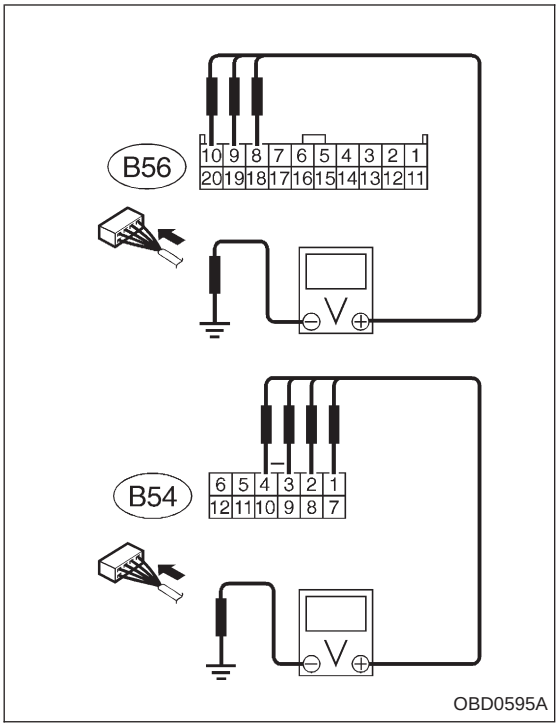
YES : Go to step **10BI6**.

NO : Go to CHECK1 .

CHECK1 ***: Is there faulty connection in the selector cable?***

YES : Repair connection of selector cable.

NO : Replace inhibitor switch.



10BI6	CHECK INPUT SIGNAL FOR TCM.

1) Turn ignition switch to OFF.
2) Connect connector to TCM and transmission.
3) Turn ignition switch to ON.
4) Measure voltage between TCM and chassis ground.

CHECK ***: Connector & terminal***
(B56) No. 9 (+) — Chassis ground (−):
- ***Is the voltage less than 1 V in "P" and "N" positions?***
- ***Is the voltage more than 8 V in other positions?***

YES : Go to next CHECK .
NO : Go to CHECK1 .

CHECK ***: Connector & terminal***
(B56) No. 10 (+) — Chassis ground (−):
- ***Is the voltage less than 1 V in "R" position?***
- ***Is the voltage more than 6 V in other positions?***

YES : Go to next CHECK .
NO : Go to CHECK1 .

CHECK ***: Connector & terminal***
(B56) No. 8 (+) — Chassis ground (−):
- ***Is the voltage less than 1 V in "N" and "P" positions?***
- ***Is the voltage more than 8 V in other positions?***

YES : Go to next CHECK .
NO : Go to CHECK1 .

CHECK ***: Connector & terminal***
(B54) No. 1 (+) — Chassis ground (−):
- ***Is the voltage less than 1 V in "D" position?***
- ***Is the voltage more than 6 V in other positions?***

YES : Go to next CHECK .
NO : Go to CHECK1 .

CHECK ***: Connector & terminal***
(B54) No. 2 (+) — Chassis ground (−):
- ***Is the voltage less than 1 V in "3" position?***
- ***Is the voltage more than 6 V in other positions?***

YES : Go to next CHECK .
NO : Go to CHECK1 .

CHECK ***: Connector & terminal (B54) No. 3 (+) — Chassis ground (−):***
- ***Is the voltage less than 1 V in "2" position?***
- ***Is the voltage more than 6 V in other positions?***

YES : Go to next CHECK .

NO : Go to CHECK1 .

CHECK ***: Connector & terminal (B54) No. 4 (+) — Chassis ground (−):***
- ***Is the voltage less than 1 V in "1" position?***
- ***Is the voltage more than 6 V in other positions?***

YES : Repair poor contact in TCM connector.

NO : Go to CHECK1 .

CHECK1 ***: Is there poor contact in TCM connector?***

YES : Repair poor contact in TCM connector.

NO : Replace TCM.

OBD (FB1)

P0710 <ATF>

OBD0380

BJ: DTC P0710 — TRANSMISSION FLUID TEMPERATURE SENSOR CIRCUIT MALFUNCTION —

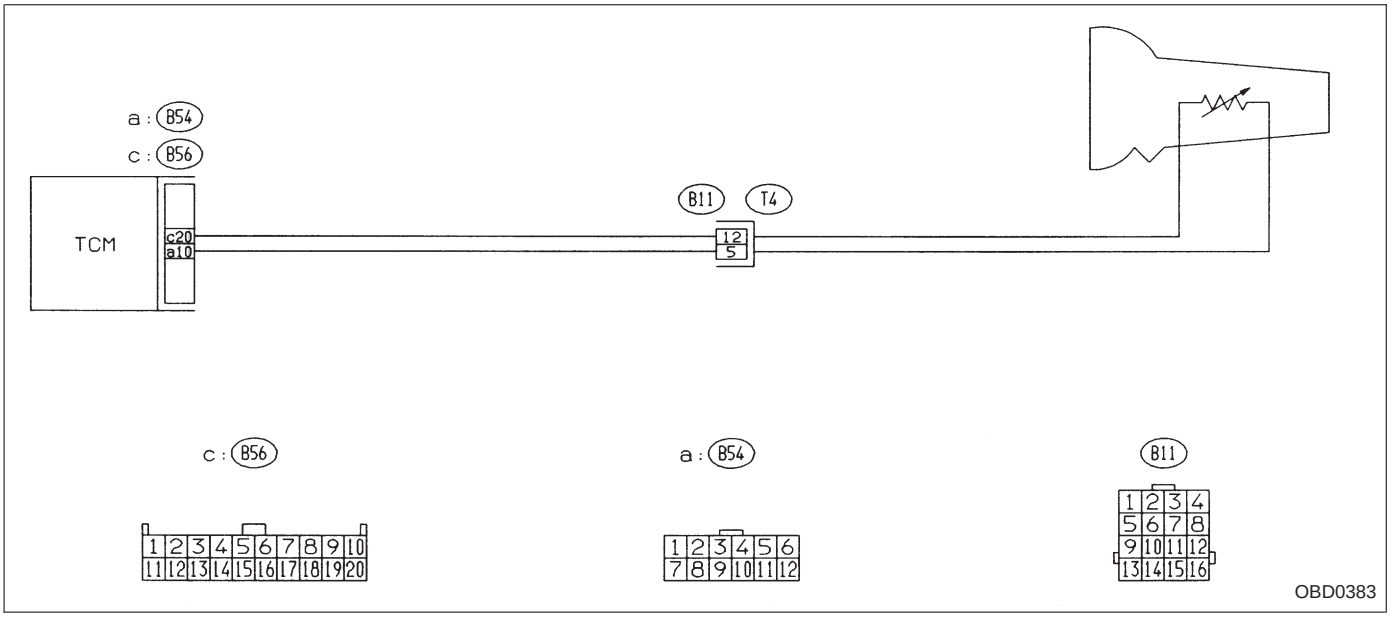
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- No shift up to 4th speed (after engine warm-up)
- No lock-up (after engine warm-up)
- Excessive shift shock

WIRING DIAGRAM:



OBD0383

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BJ1	CHECK DTC P0710 ON DISPLAY.

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0710?***

YES : Check ATF temperature sensor circuit. <Ref. to 3-2 [T7F0].>

NO : It is not necessary to inspect DTC P0710.

OBD	(FB1)
P0720	<ATVSP>

OBD0392

BK: DTC P0720 — OUTPUT SPEED SENSOR (VEHICLE SPEED SENSOR 1) CIRCUIT MALFUNCTION —

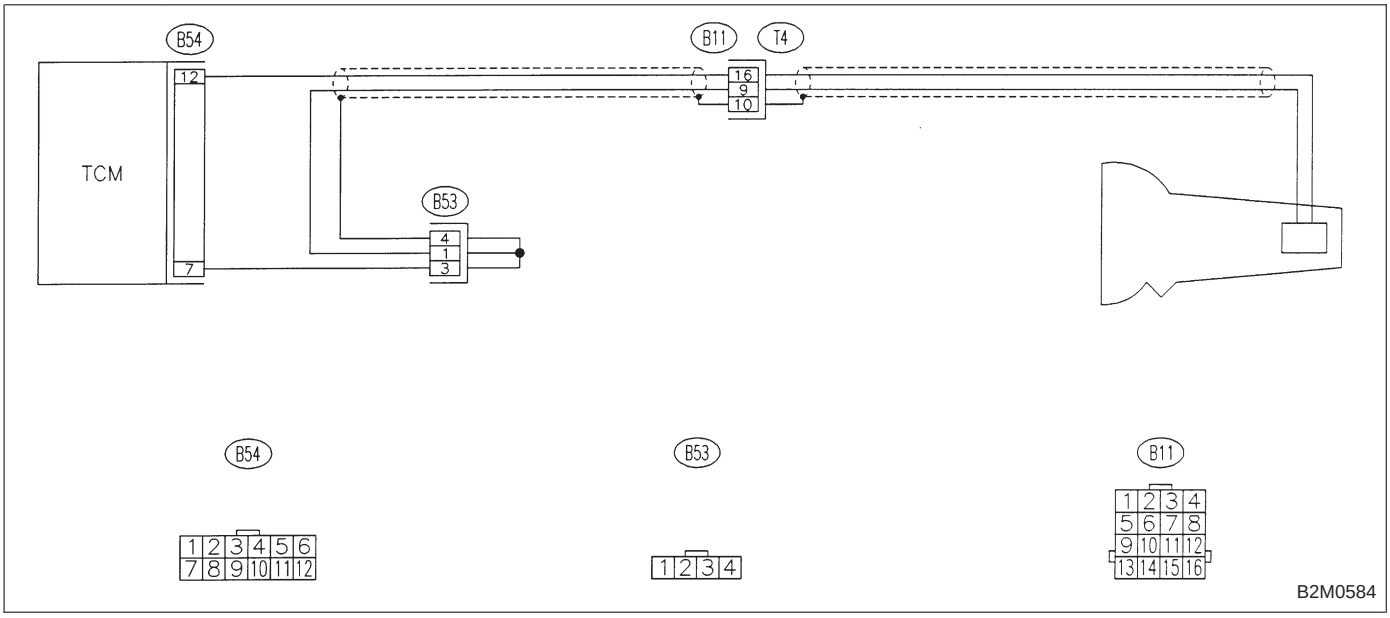
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- No shift or excessive tight corner “braking”

WIRING DIAGRAM:



B2M0584

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BK1	CHECK DTC P0720 ON DISPLAY.

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0720?***

YES : Check vehicle speed sensor 1 circuit. <Ref. to 3-2 [T7L0].>

NO : It is not necessary to inspect DTC P0720.

OBD (FB1)

P0725 <ATNE>

OBD0404

BL: DTC P0725 — ENGINE SPEED INPUT CIRCUIT MALFUNCTION —

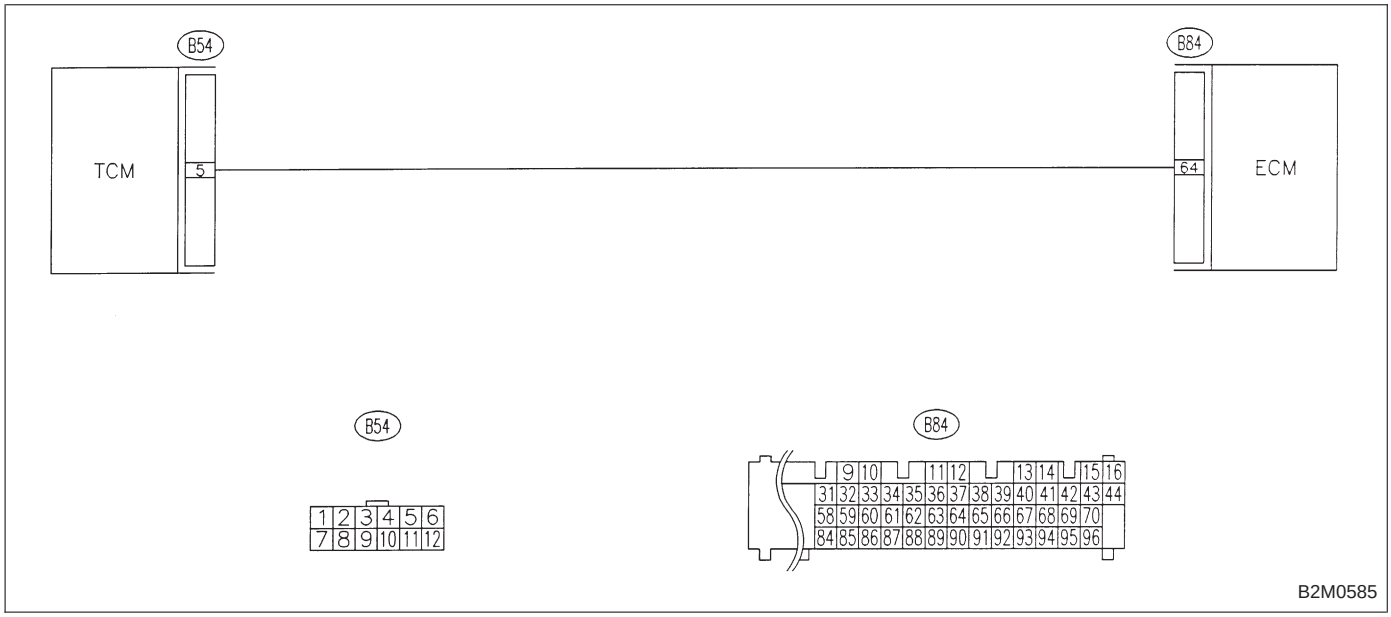
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- No lock-up (after engine warm-up)
- AT diagnostic indicator light (AT OIL TEMP indicator light) remains on when vehicle speed is “0”.

WIRING DIAGRAM:



B2M0585

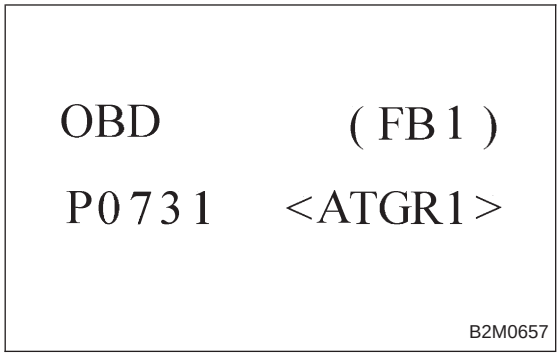
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BL1	CHECK DTC P0725 ON DISPLAY.

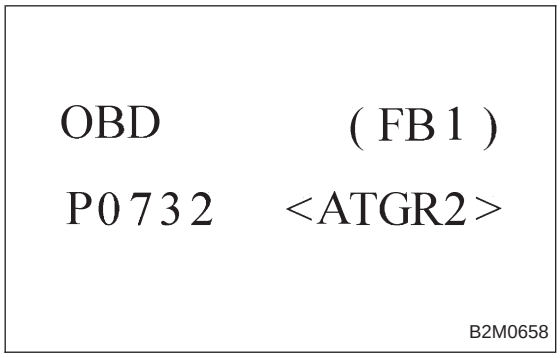
CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0725?***

YES : Check engine speed input signal circuit. <Ref. to 3-2 [T7H0].>

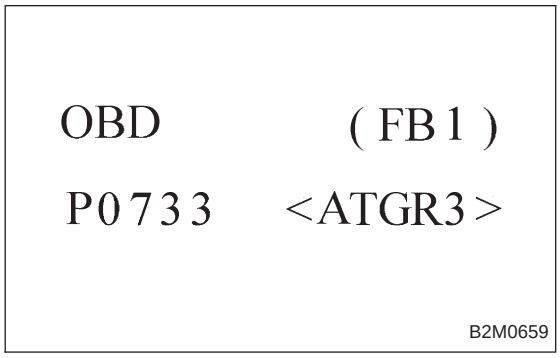
NO : It is not necessary to inspect DTC P0725.



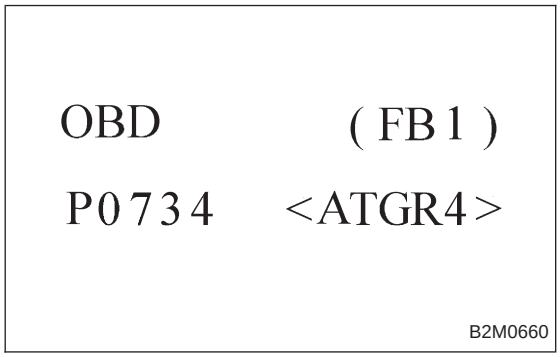
BM: DTC P0731 — GEAR 1 INCORRECT RATIO —



BN: DTC P0732 — GEAR 2 INCORRECT RATIO —



BO: DTC P0733 — GEAR 3 INCORRECT RATIO —



BP: DTC P0734 — GEAR 4 INCORRECT RATIO —

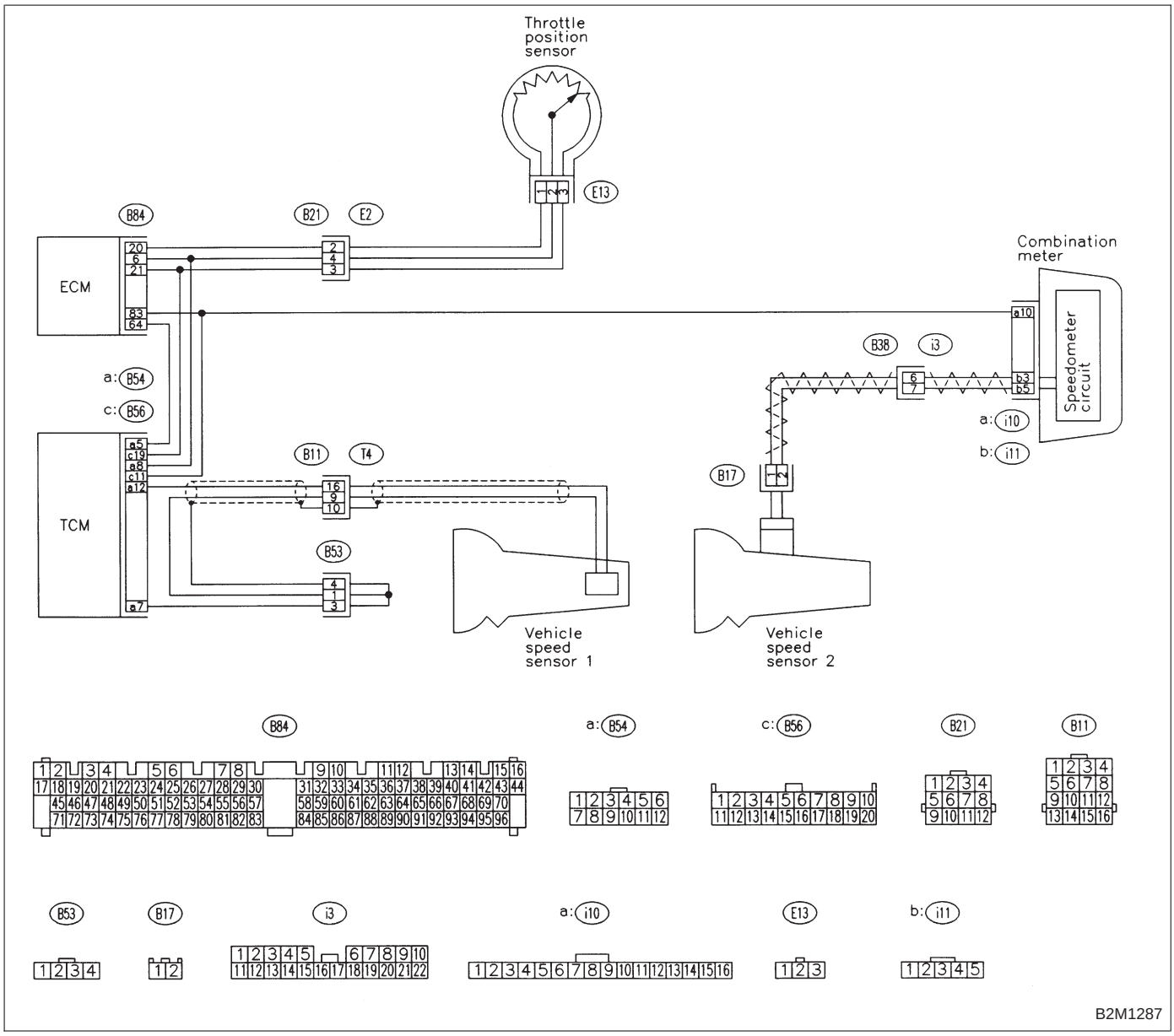
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Shift point too high or too low; engine brake not effected in “3” range; excessive shift shock; excessive tight corner “braking”

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BP1	**CHECK ANY OTHER DTC (BESIDES DTC P0731, P0732, P0733, P0734) ON DISPLAY.**

CHECK ***: Is there any other DTC on display?***

YES : Inspect relevant DTC using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NO : Go to step **10BP2**.

10BP2	CHECK THROTTLE POSITION SENSOR CIRCUIT.

Check throttle position sensor circuit. <Ref. to 3-2 [T7K0].>

CHECK ***: Is there any trouble in throttle position sensor circuit?***

YES : Repair or replace throttle position sensor circuit.

NO : Go to step **10BP3**.

10BP3	CHECK VEHICLE SPEED SENSOR 1 CIRCUIT.

Check vehicle speed sensor 1 circuit. <Ref. to 3-2 [T7L0].>

CHECK ***: Is there any trouble in vehicle speed sensor 1 circuit?***

YES : Repair or replace vehicle speed sensor 1 circuit.

NO : Go to step **10BP4**.

10BP4	CHECK VEHICLE SPEED SENSOR 2 CIRCUIT.

Check vehicle speed sensor 2 circuit. <Ref. to 3-2 [T7M0].>

CHECK ***: Is there any trouble in vehicle speed sensor 2 circuit?***

YES : Repair or replace vehicle speed sensor 2 circuit.

NO : Go to step **10BP5**.

10BP5	CHECK ENGINE SPEED INPUT CIRCUIT.

Check engine speed input circuit. <Ref. to 3-2 [T7H0].>

CHECK ***: Is there any trouble in engine speed input circuit?***

YES : Repair or replace engine speed input circuit.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in TCM connector?***

YES : Repair poor contact in TCM connector.

NO : Go to next CHECK .

CHECK ***: Is there any mechanical trouble in automatic transmission?***

YES : Repair or replace automatic transmission.

NO : Replace TCM.

OBD (FB1)

P0740 <ATLU_F>

B2M0661

BQ: DTC P0740 — TORQUE CONVERTER CLUTCH SYSTEM MALFUNCTION —

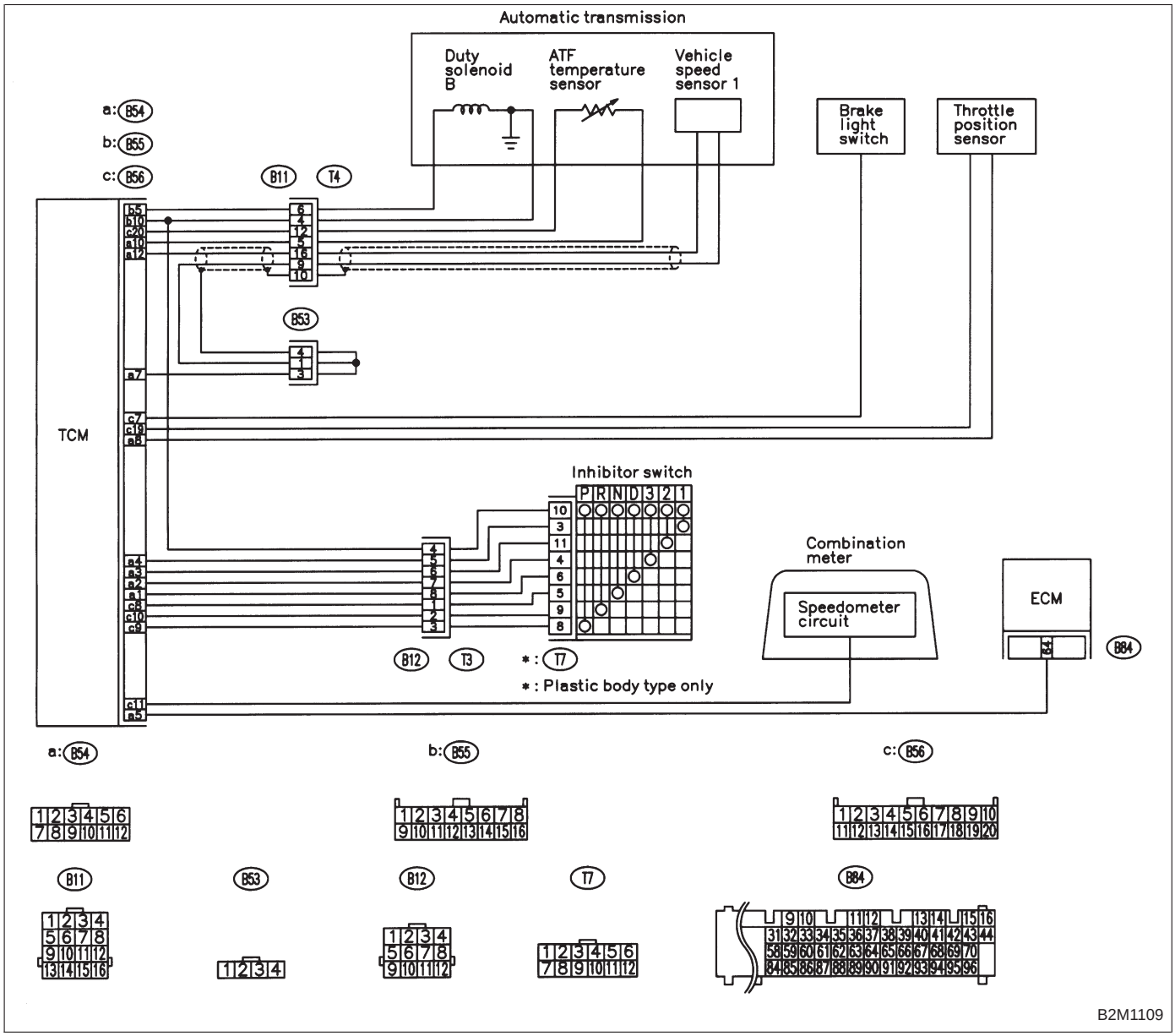
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- No lock-up (after engine warm-up)
- No shift or excessive tight corner “braking”

WIRING DIAGRAM:



B2M1109

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BQ1	**CHECK ANY OTHER DTC (BESIDES DTC P0740) ON DISPLAY.**

CHECK ***: Is there any other DTC on display?***
YES : Inspect the relevant DTC using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>
NO : Go to step **10BQ2**.

10BQ2	**CHECK DUTY SOLENOID B CIRCUIT.**

Check duty solenoid B circuit. <Ref. to 3-2 [T7B0].>
CHECK ***: Is there any trouble in duty solenoid B circuit?***
YES : Repair or replace duty solenoid B circuit.
NO : Go to step **10BQ3**.

10BQ3	**CHECK THROTTLE POSITION SENSOR CIRCUIT.**

Check throttle position sensor circuit. <Ref. to 3-2 [T7K0].>
CHECK ***: Is there any trouble in throttle position sensor circuit?***
YES : Repair or replace throttle position sensor circuit.
NO : Go to step **10BQ4**.

10BQ4	**CHECK VEHICLE SPEED SENSOR 1 CIRCUIT.**

Check vehicle speed sensor 1 circuit. <Ref. to 3-2 [T7L0].>
CHECK ***: Is there any trouble in vehicle speed sensor 1 circuit?***
YES : Repair or replace vehicle speed sensor 1 circuit.
NO : Go to step **10BQ5**.

10BQ5	CHECK VEHICLE SPEED SENSOR 2 CIRCUIT.

Check vehicle speed sensor 2 circuit. <Ref. to 3-2 [T7M0].>

CHECK ***: Is there any trouble in vehicle speed sensor 2 circuit?***

YES : Repair or replace vehicle speed sensor 2 circuit.

NO : Go to step **10BQ6**.

10BQ6	CHECK ENGINE SPEED INPUT CIRCUIT.

Check engine speed input circuit. <Ref. to 3-2 [T7H0].>

CHECK ***: Is there any trouble in engine speed input circuit?***

YES : Repair or replace engine speed input circuit.

NO : Go to step **10BQ7**.

10BQ7	CHECK INHIBITOR SWITCH CIRCUIT.

Check inhibitor switch circuit. <Ref. to 2-7 [T10BI0].>

CHECK ***: Is there any trouble in inhibitor switch circuit?***

YES : Repair or replace inhibitor switch circuit.

NO : Go to step **10BQ8**.

10BQ8	CHECK BRAKE LIGHT SWITCH CIRCUIT.

Check brake light switch circuit. <Ref. to 2-7 [T10BH0].>

CHECK ***: Is there any trouble in brake light switch circuit?***

YES : Repair or replace brake light switch circuit.

NO : Go to step **10BQ9**.

10BQ9	CHECK ATF TEMPERATURE SENSOR CIRCUIT.

Check ATF temperature sensor circuit. <Ref. to 3-2 [T7F0].>

CHECK ***: Is there any trouble in ATF temperature sensor circuit?***

YES : Repair or replace ATF temperature sensor circuit.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in TCM connector?***

YES : Repair poor contact in TCM connector.

NO : Go to next CHECK .

CHECK ***: Is there any mechanical trouble in automatic transmission?***

YES : Repair or replace automatic transmission.

NO : Replace TCM.

OBD (FB1)
P0743 <ATLU>
B2M0662

BR: DTC P0743 — TORQUE CONVERTER CLUTCH SYSTEM (DUTY SOLENOID B) ELECTRICAL —

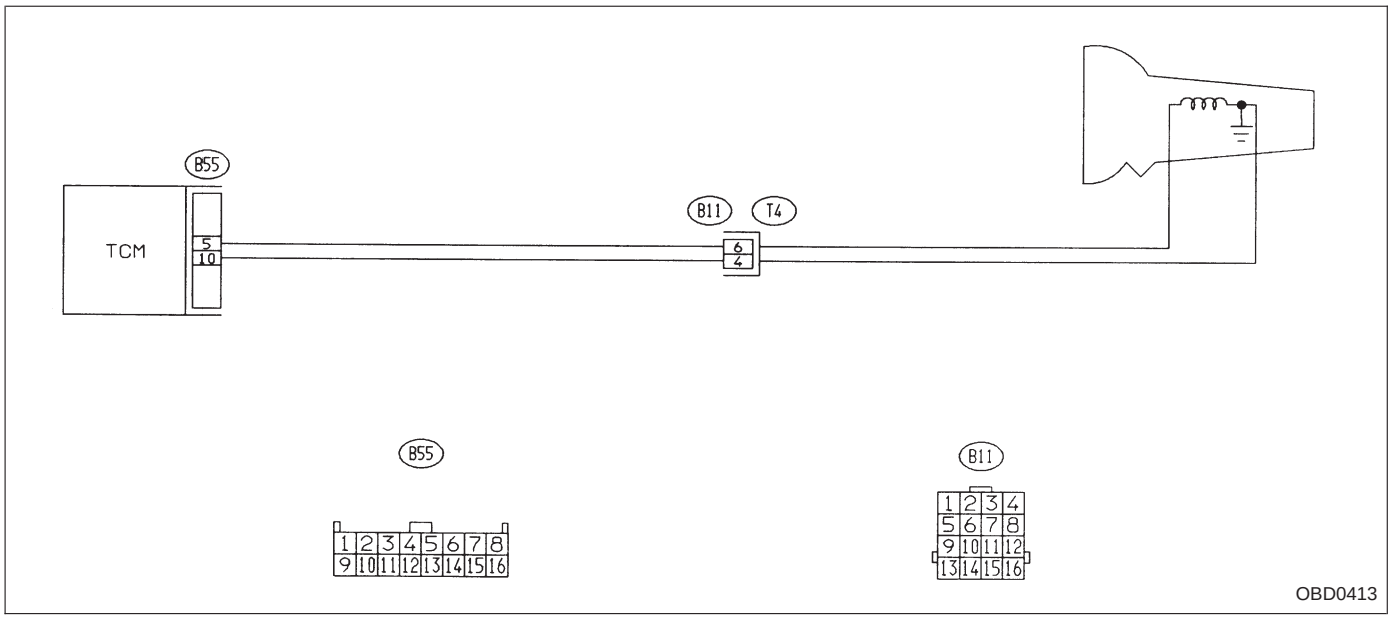
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- No lock-up (after engine warm-up)

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BR1	CHECK DTC P0743 ON DISPLAY.

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0743?***

YES : Check duty solenoid B circuit. <Ref. to 3-2 [T7B0].>

NO : It is not necessary to inspect DTC P0743.

OBD (FB1)
P0748 <ATPL>
B2M0663

BS: DTC P0748 — PRESSURE CONTROL SOLENOID (DUTY SOLENOID A) ELECTRICAL —

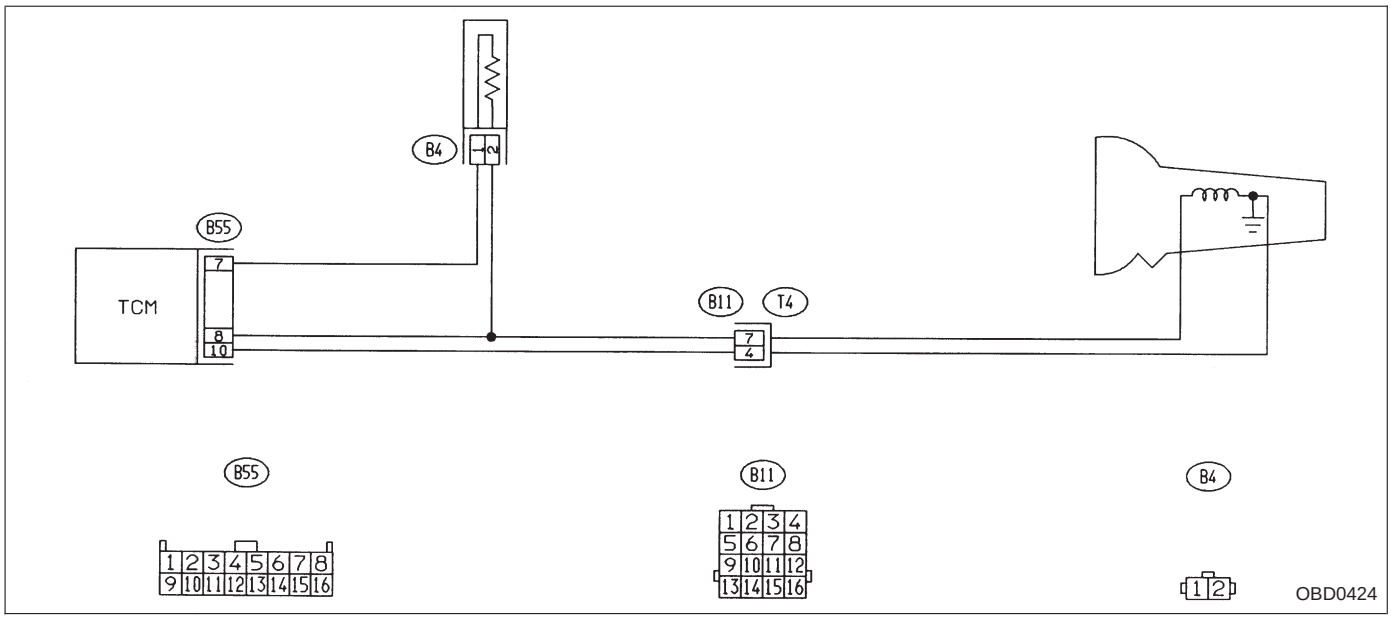
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Excessive shift shock

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BS1	**CHECK DTC P0748 ON DISPLAY.**

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0748?***

YES : Check duty solenoid A circuit. <Ref. to 3-2 [T7A0].>

NO : It is not necessary to inspect DTC P0748.

OBD (FB1)

P0753 <ATSFT1>

B2M0664

BT: DTC P0753 — SHIFT SOLENOID A (SHIFT SOLENOID 1) ELECTRICAL —

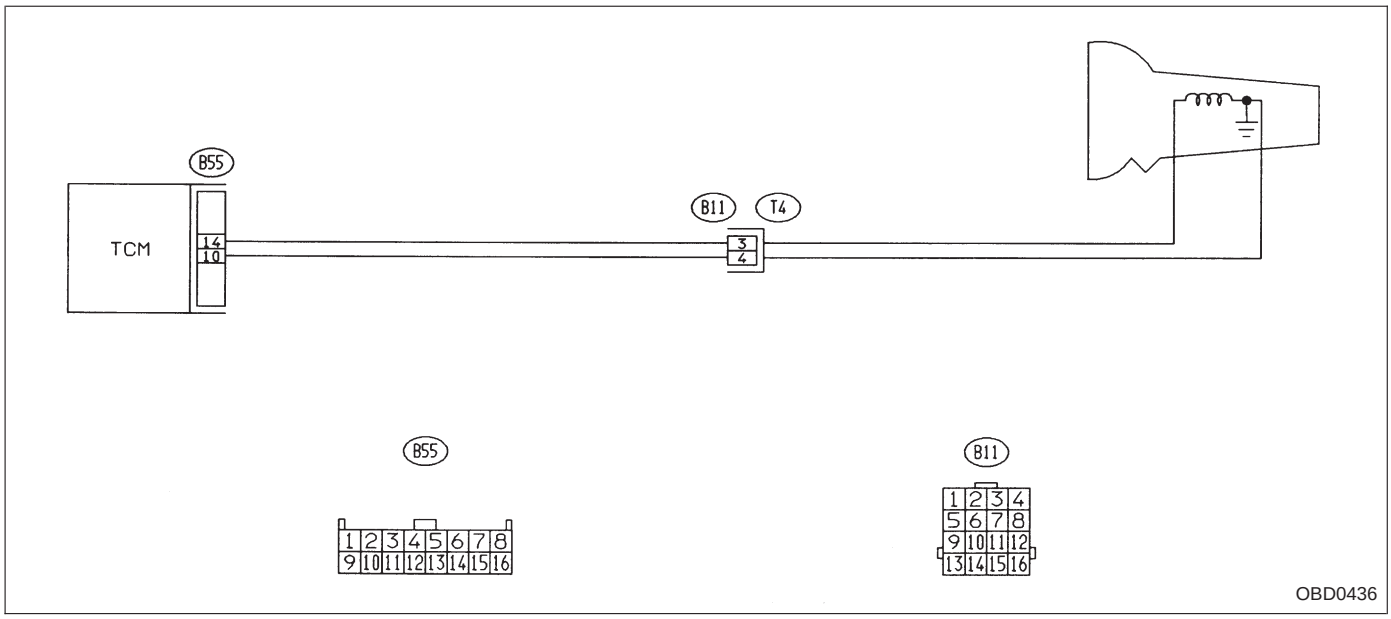
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- No shift

WIRING DIAGRAM:



OBD0436

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BT1	CHECK DTC P0753 ON DISPLAY.

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0753?***

YES : Check shift solenoid 1 circuit. <Ref. to 3-2 [T7E0].>

NO : It is not necessary to inspect DTC P0753.

OBD (FB1)

P0758 <ATSFT2>

B2M0665

BU: DTC P0758 — SHIFT SOLENOID B (SHIFT SOLENOID 2) ELECTRICAL —

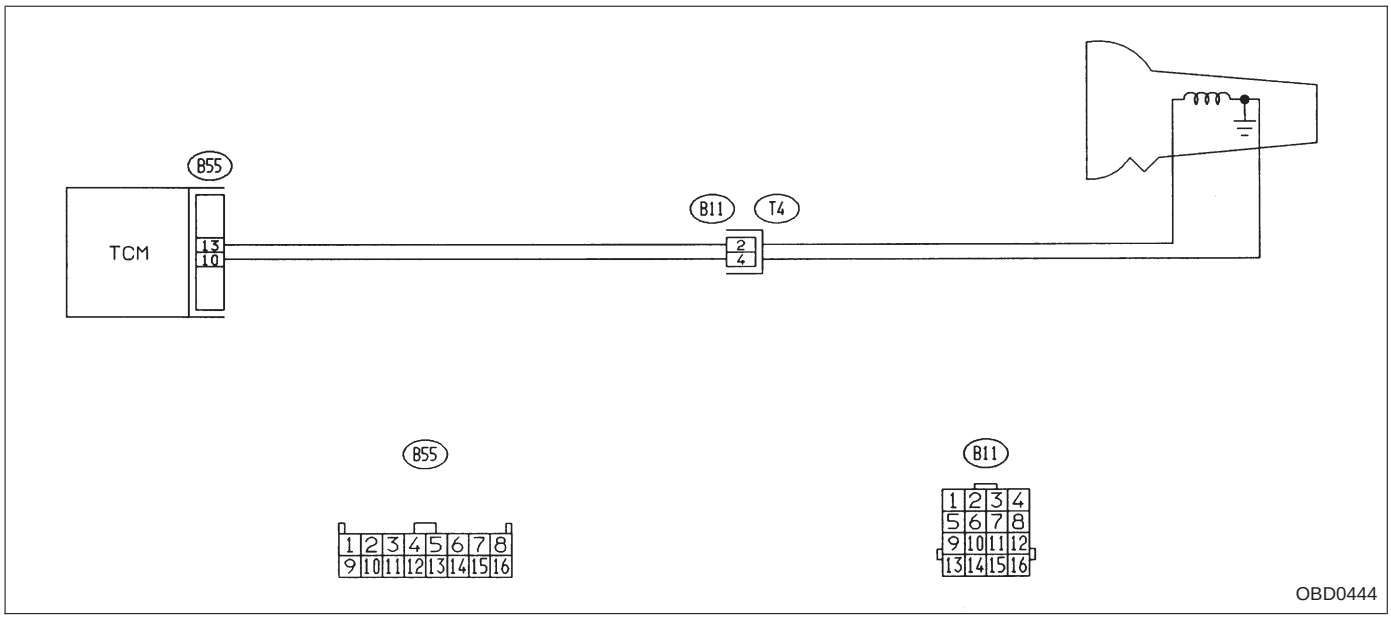
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- No shift

WIRING DIAGRAM:



OBD0444

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BU1	**CHECK DTC P0758 ON DISPLAY.**

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0758?***

YES : Check shift solenoid 2 circuit. <Ref. to 3-2 [T7D0].>

NO : It is not necessary to inspect DTC P0758.

OBD (FB1)

P0760<ATOVR_F>

B2M0666

BV: DTC P0760 — SHIFT SOLENOID C (SHIFT SOLENOID 3) MALFUNCTION —

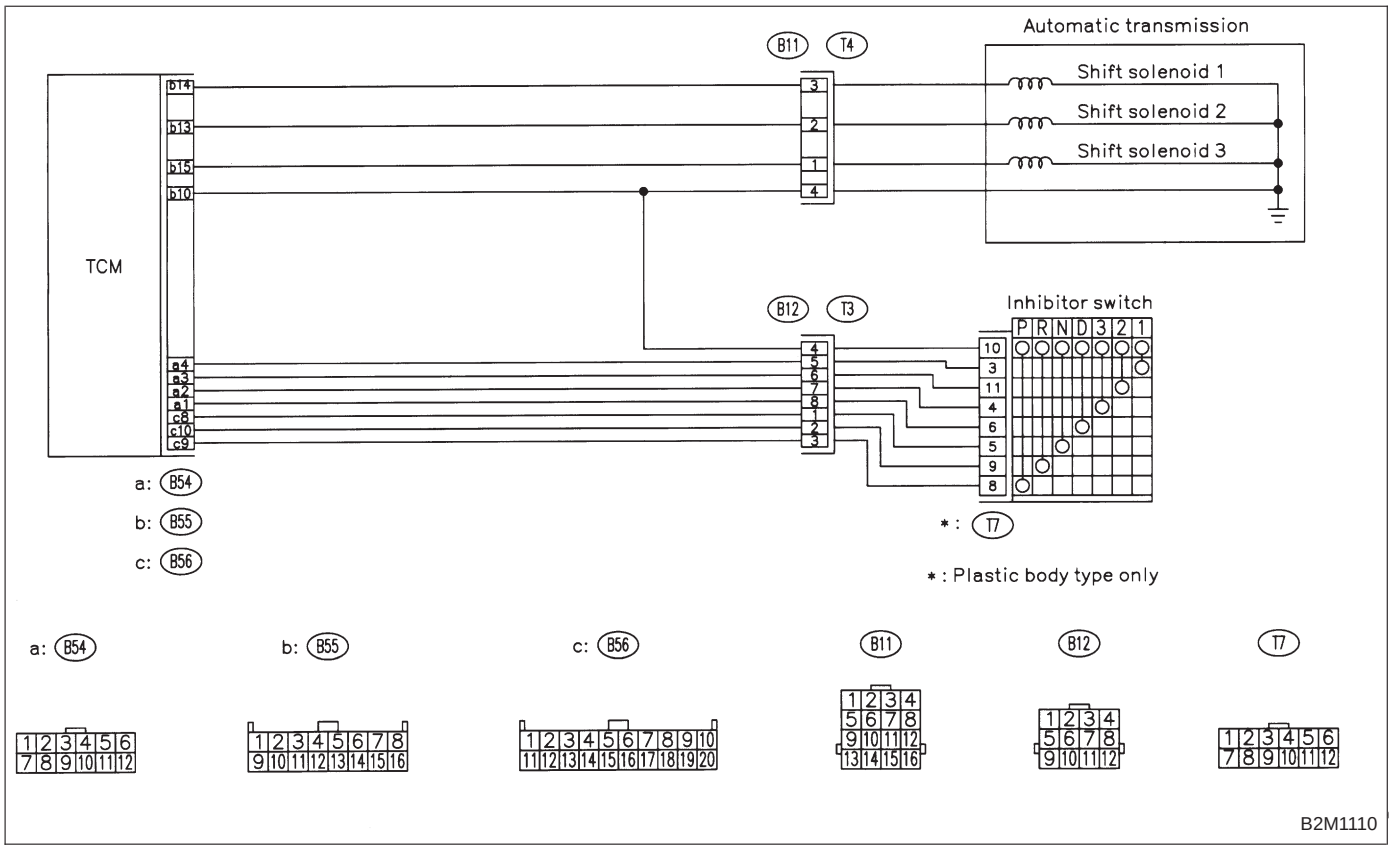
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Ineffective engine brake with selector lever in “3”

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BV1	**CHECK ANY OTHER DTC (BESIDES DTC P0760) ON DISPLAY.**

CHECK ***: Is there any other DTC on display?***

YES : Inspect relevant DTC using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NO : Go to step **10BV2**.

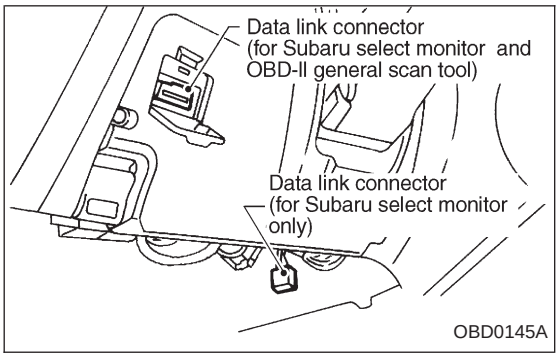
10BV2	CHECK INHIBITOR SWITCH CIRCUIT.

Check inhibitor switch circuit. <Ref. to 2-7 [T10BI0].>

CHECK ***: Is there any trouble in inhibitor switch circuit?***

YES : Repair or replace inhibitor switch circuit.

NO : Go to step **10BV3**.



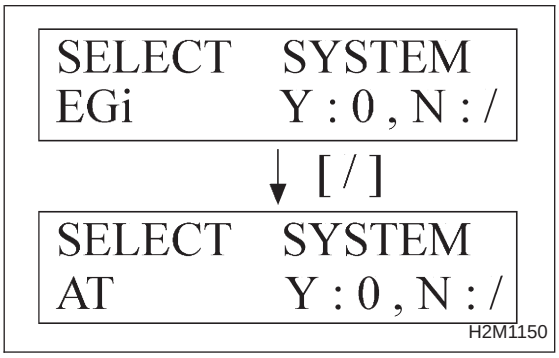
OBD0145A

10BV3	CHECK GEAR POSITION.

1) Turn ignition switch to OFF.
2) Connect the Subaru select monitor to data link connector.
3) Lift-up or raise the vehicle and support with safety stands.

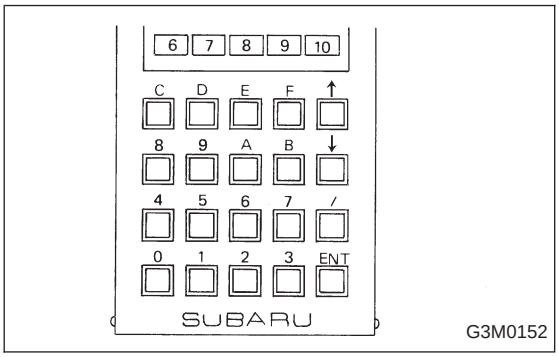
CAUTION:
On AWD models, raise all wheels off ground.

4) Start and warm-up the engine and transmission.



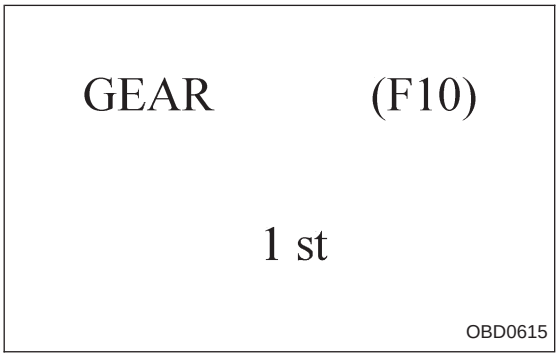
H2M1150

5) Subaru select monitor switch to ON.
6) Select AT mode using function key.
Press the function key [/], and change to AT mode.
7) Press the function key [0].



G3M0152

8) Designate mode using function key.
Function mode for AT: F10



OBD0615

9) Move selector lever to “D” and drive the vehicle.
10) Read data on Subaru select monitor.

CHECK ***: Does gear position change according to throttle position and vehicle speed?***

YES : Go to next CHECK .

NO : Go to step **10BV4**.

CHECK ***: Is there poor contact in TCM connector?***

YES : Repair poor contact in TCM connector.

NO : Go to next CHECK .

CHECK ***: Is there any mechanical trouble in automatic transmission?***

YES : Repair or replace automatic transmission.

NO : Replace TCM.

10BV4	CHECK SHIFT SOLENOID 1 CIRCUIT.

Check shift solenoid 1 circuit. <Ref. to 3-2 [T7E0].>

CHECK ***: Is there any trouble in shift solenoid 1 circuit?***

YES : Repair or replace shift solenoid 1 circuit.

NO : Go to step **10BV5**.

10BV5	CHECK SHIFT SOLENOID 2 CIRCUIT.

Check shift solenoid 2 circuit. <Ref. to 3-2 [T7D0].>

CHECK ***: Is there any trouble in shift solenoid 2 circuit?***

YES : Repair or replace shift solenoid 2 circuit.

NO : Go to step **10BV6**.

10BV6	CHECK SHIFT SOLENOID 3 CIRCUIT.

Check shift solenoid 3 circuit. <Ref. to 3-2 [T7C0].>

CHECK ***: Is there any trouble in shift solenoid 3 circuit?***

YES : Repair or replace shift solenoid 3 circuit.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in TCM connector?***

YES : Repair poor contact in TCM connector.

NO : Go to next CHECK .

CHECK ***: Is there any mechanical trouble in automatic transmission?***

YES : Repair or replace automatic transmission.

NO : Replace TCM.

OBD (FB1)
P0763 <ATOVR>
B2M0667

BW: DTC P0763 — SHIFT SOLENOID C (SHIFT SOLENOID 3) ELECTRICAL —

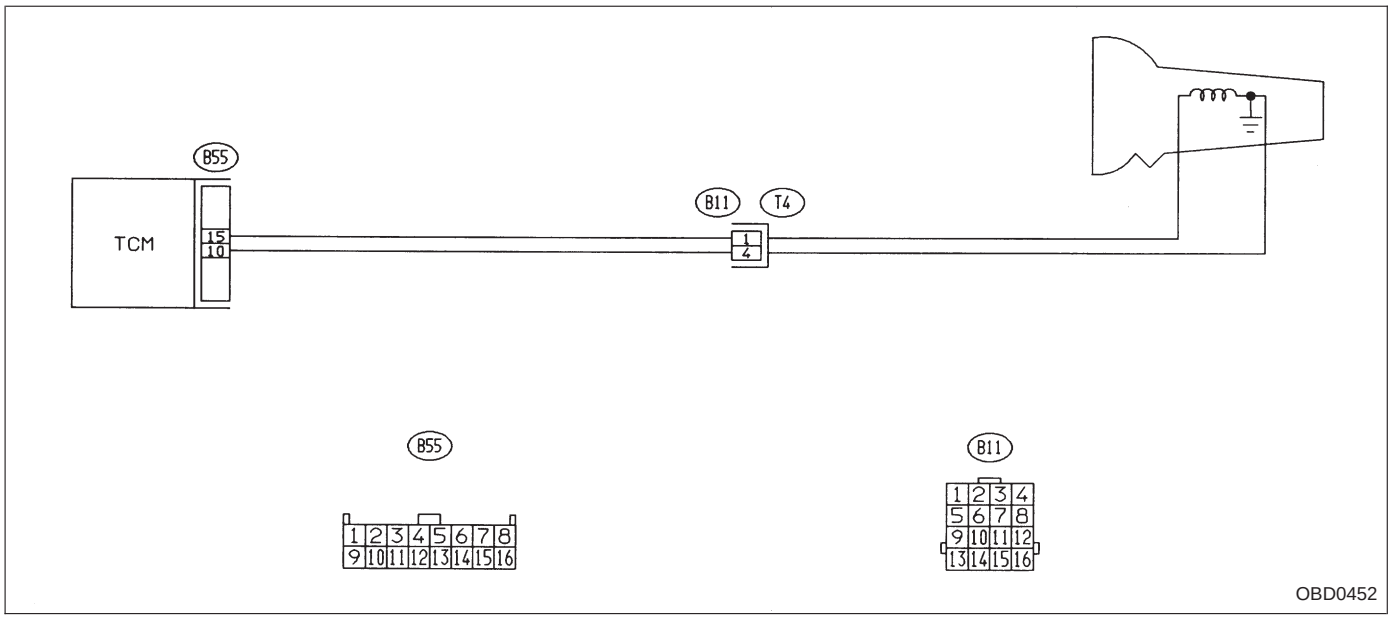
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Ineffective engine brake with selector lever in “3”

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BW1	**CHECK DTC P0763 ON DISPLAY.**

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0763?***

YES : Check shift solenoid 3 circuit. <Ref. to 3-2 [T7C0].>

NO : It is not necessary to inspect DTC P0763.

OBD (FB1)

P1100 <ST_SWOFF>

B2M1113

BX: DTC P1100 — STARTER SWITCH CIRCUIT LOW INPUT —

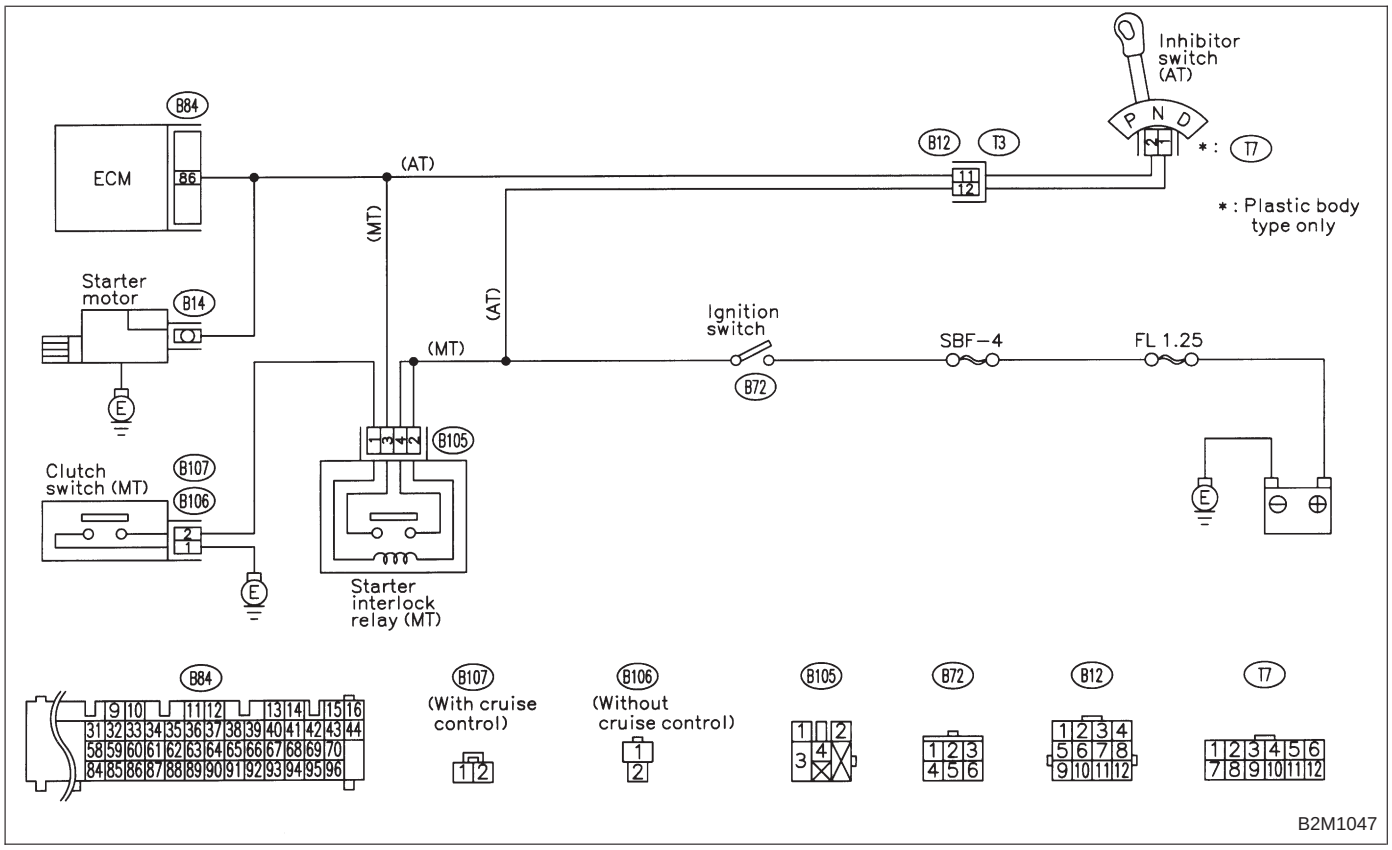
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Failure of engine to start

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BX1	**CHECK OPERATION OF STARTER MOTOR.**

CHECK ***: Does starter motor operate when ignition switch to "ST"?***

NOTE:
- On AT vehicles, place the inhibitor switch in the "P" or "N" position.
- On MT vehicles, depress the clutch pedal.

YES : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open or ground short circuit in harness between ECM and starter motor connector.
- Poor contact in ECM connector.

NO : Check starter motor circuit. <Ref. to 2-7 [T8B0].>

OBD (FB1)
P1101 <N_SW>
B2M1114

BY: DTC P1101 — NEUTRAL POSITION SWITCH CIRCUIT MALFUNCTION [MT VEHICLES] —

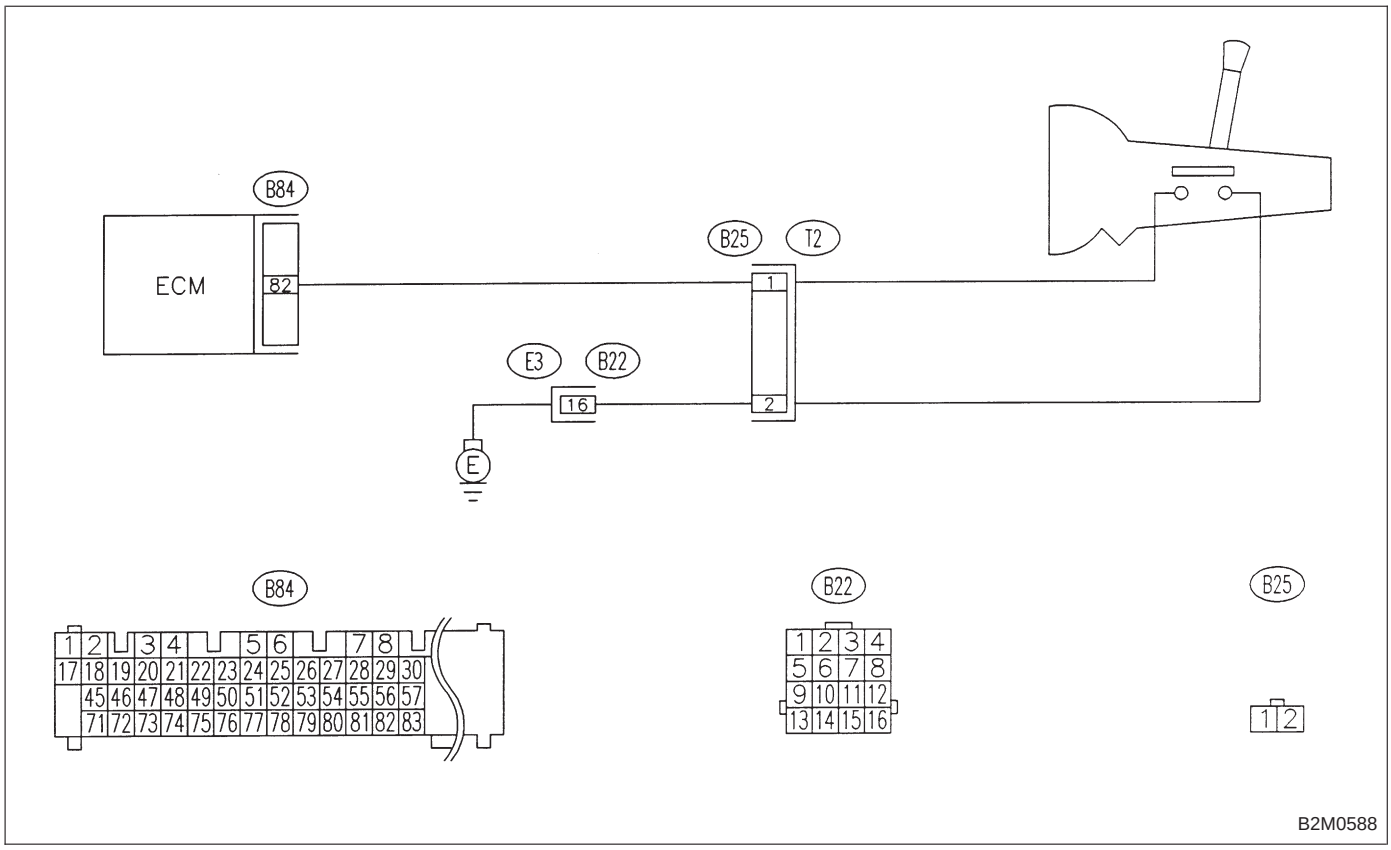
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

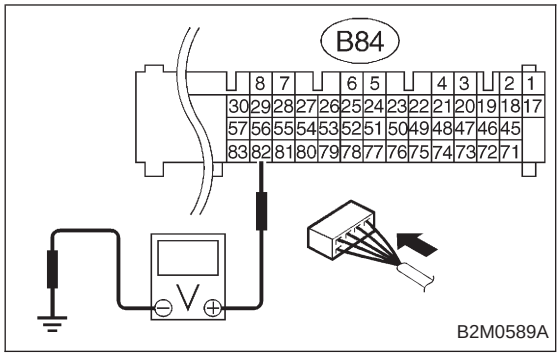
- Erroneous idling

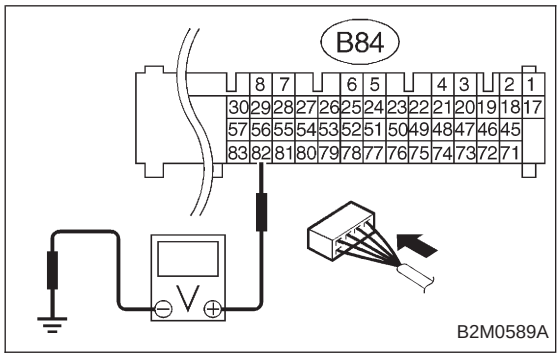
WIRING DIAGRAM:



B2M0588

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>





10BY1	CHECK INPUT SIGNAL FOR ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 82 (+) — Chassis ground (−): Is the voltage between 4.5 and 5.5 V in neutral position?***

YES : Go to next CHECK .

NO : Go to step **10BY2**.

CHECK ***: Connector & terminal (B84) No. 82 (+) — Chassis ground (−): Is the voltage less than 1 V in other positions?***

YES : Go to next CHECK .

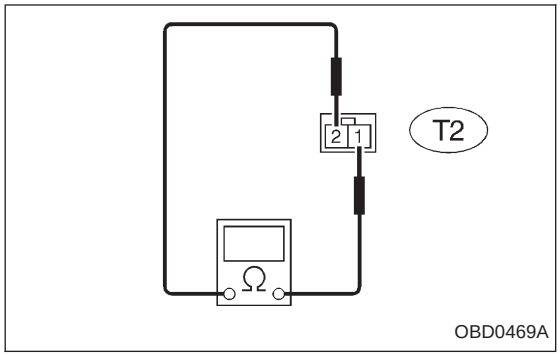
NO : Go to step **10BY2**.

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.



10BY2	CHECK NEUTRAL POSITION SWITCH.

1) Turn ignition switch to OFF.
2) Disconnect connector from transmission harness.
3) Measure resistance between transmission harness and connector terminals.

CHECK : ***Connector & terminal (T2) No. 1 — No. 2: Is the resistance more than 1 MΩ in neutral position?***

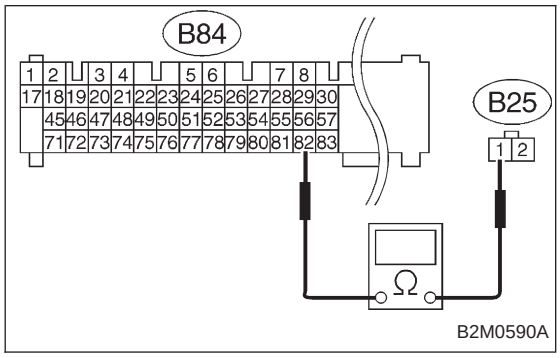
YES : Go to next CHECK .

NO : Repair short circuit in transmission harness or replace neutral position switch.

CHECK : ***Connector & terminal (T2) No. 1 — No. 2: Is the resistance less than 1 Ω in other positions?***

YES : Go to step **10BY3**.

NO : Repair open circuit in transmission harness or replace neutral position switch.



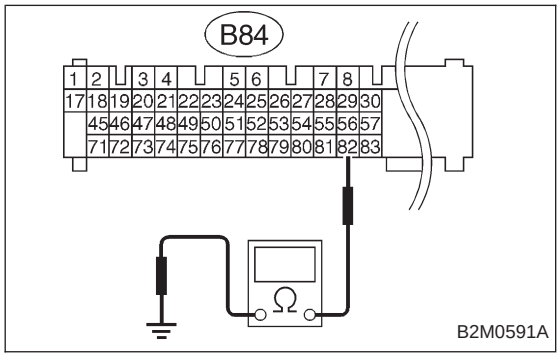
10BY3	CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH.

1) Disconnect connector from ECM.
2) Measure resistance of harness between ECM and transmission harness connector.

CHECK : ***Connector & terminal (B84) No. 82 — (B25) No. 1: Is the resistance less than 1 Ω?***

YES : Go to next step 3).

NO : Repair open circuit in harness between ECM and transmission harness connector.

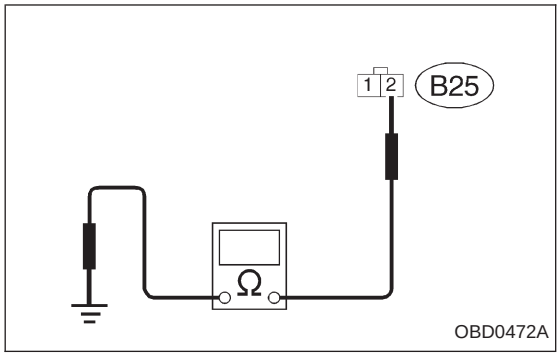


3) Measure resistance between ECM and chassis ground.

CHECK : ***Connector & terminal (B84) No. 82 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between ECM and transmission harness connector.

NO : Go to next step 4).



4) Measure resistance of harness between transmission harness connector and engine ground.

CHECK ***: Connector & terminal (B25) No. 2 — Engine ground: Is the resistance less than 5 Ω?***

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:

- Open circuit in harness between transmission harness connector and engine grounding terminal
- Poor contact in coupling connector (B22)

CHECK ***: Is there poor contact in transmission harness connector?***

YES : Repair poor contact in transmission harness connector.

NO : Replace ECM.

OBD (FB1)

P1101 <N_SWOFF>

B2M1115

BZ: DTC P1101 — NEUTRAL POSITION SWITCH CIRCUIT HIGH INPUT [AT VEHICLES] —

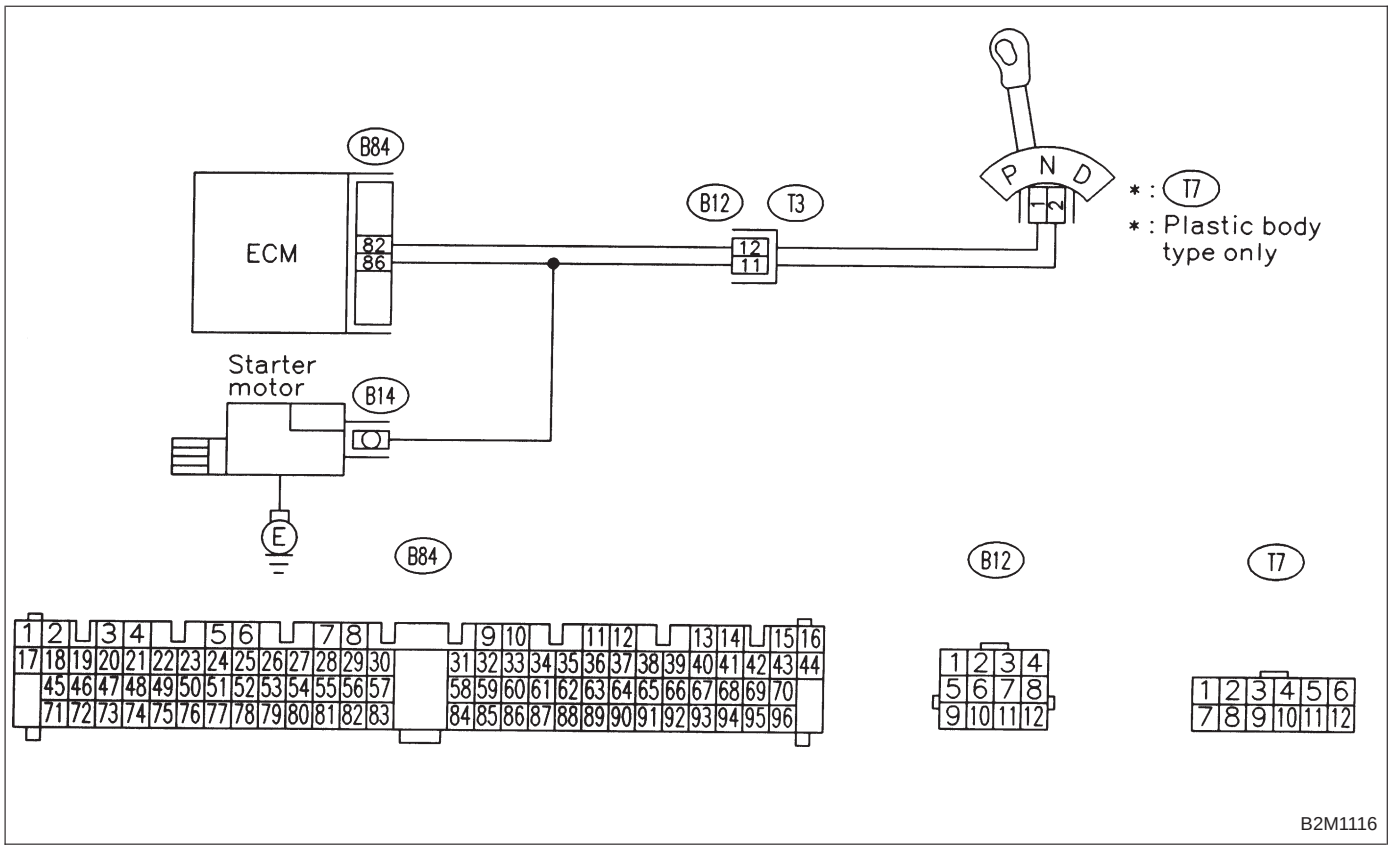
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Erroneous idling

WIRING DIAGRAM:



B2M1116

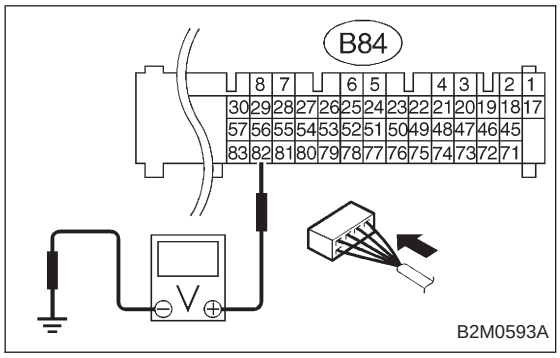
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BZ1	CHECK DTC P0705 ON DISPLAY.

CHECK : ***Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0705?***

YES : Inspect DTC P0705 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NO : Go to step **10BZ2**.



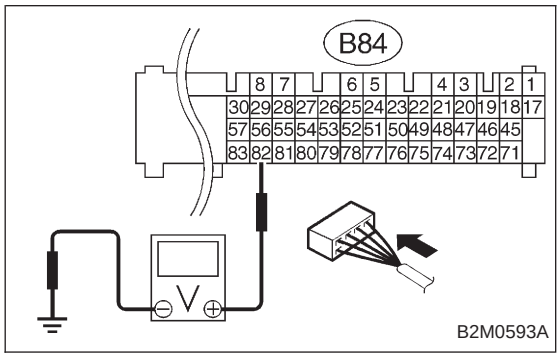
10BZ2	CHECK INPUT SIGNAL FOR ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK : ***Connector & terminal (B84) No. 82 (+) — Chassis ground (−): Is the voltage less than 1 V in “N” and “P” positions?***

YES : Go to next CHECK .

NO : Go to step **10BZ3**.



CHECK : ***Connector & terminal (B84) No. 82 (+) — Chassis ground (−): Is the voltage between 4.5 and 5.5 V in other positions?***

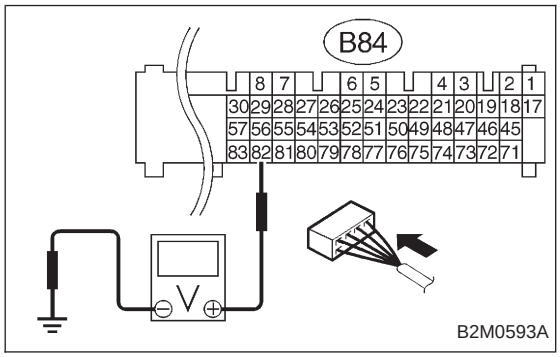
YES : Go to next CHECK .

NO : Go to step **10BZ3**.

CHECK : ***Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



10BZ3	CHECK INPUT SIGNAL FOR ECM.

Measure voltage between ECM and chassis ground.

CHECK : ***Connector & terminal (B84) No. 82 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and inhibitor switch connector.

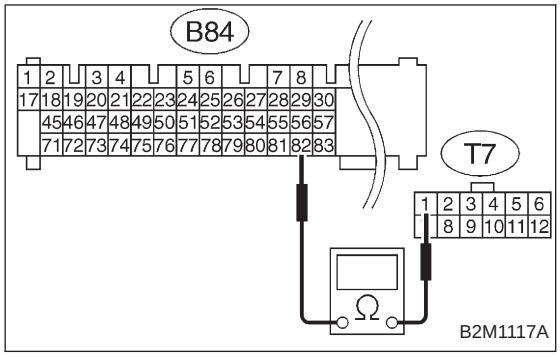
NO : Go to step **10BZ4**.

10BZ4	CHECK INHIBITOR SWITCH TYPE.

CHECK : ***Is inhibitor switch type plastic body?***

YES : Go to step **10BZ5**.

NO : Go to step **10BZ7**.



10BZ5	CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH.

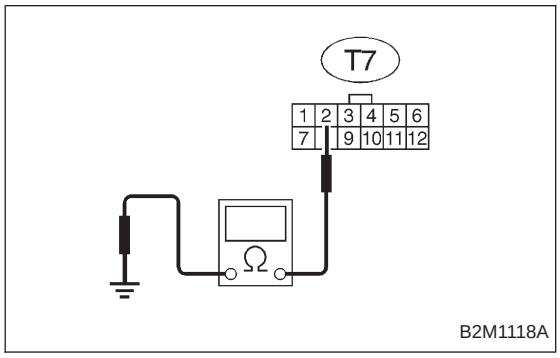
1) Turn ignition switch to OFF.
2) Disconnect connectors from ECM and inhibitor switch.
3) Measure resistance of harness between ECM and inhibitor switch connector.

CHECK ***: Connector & terminal***
(B84) No. 82 — (T7) No. 1:
Is the resistance less than 1 Ω?

YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and inhibitor switch connector
- Poor contact in coupling connector (B12)
- Poor contact in inhibitor switch connector
- Poor contact in ECM connector

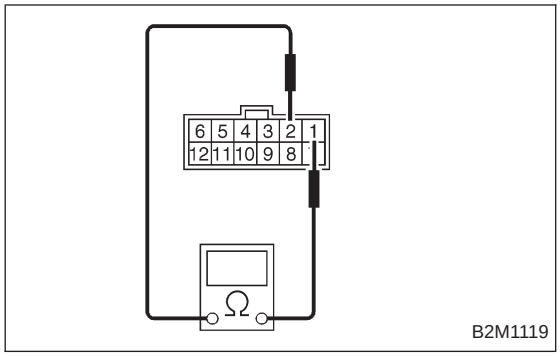


4) Measure resistance of harness between inhibitor switch connector and engine ground.

CHECK ***: Connector & terminal***
(T7) No. 2 — Engine ground:
Is the resistance less than 5 Ω?

YES : Go to step **10BZ6**.

NO : Repair open circuit in inhibitor switch ground line.



10BZ6	CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

CHECK ***: Terminals No. 1 — No. 2: Is the resistance less than 1 Ω in "N" and "P" positions?***

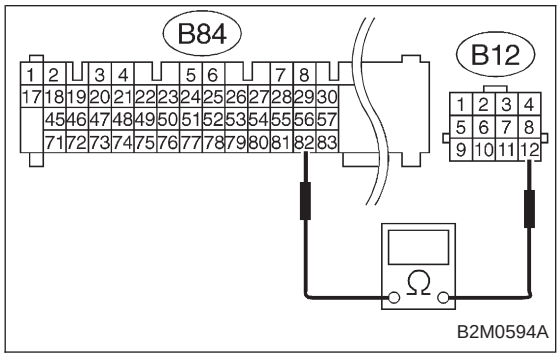
YES : Go to next CHECK .

NO : Replace inhibitor switch.

CHECK ***: Is there any fault in selector cable connection to inhibitor switch?***

YES : Repair selector cable connection. <Ref. to 3-2 [W2B2].>

NO : Replace ECM.



10BZ7	CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR.

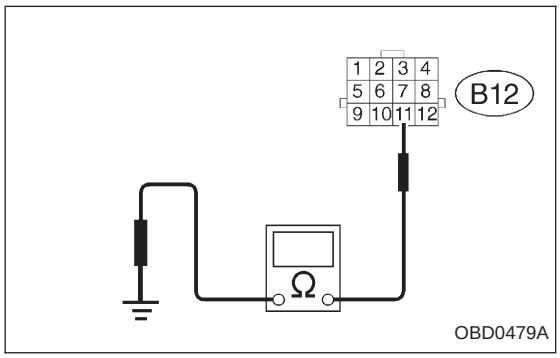
1) Turn ignition switch to OFF.
2) Disconnect connectors from ECM and transmission harness connector.
3) Measure resistance of harness between ECM and transmission harness connector.

CHECK ***: Connector & terminal (B84) No. 82 — (B12) No. 12: Is the resistance less than 1 Ω?***

YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and transmission harness connector
- Poor contact in transmission harness connector
- Poor contact in ECM connector

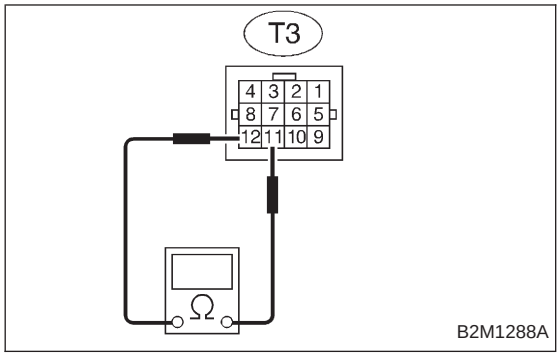


4) Measure resistance of harness between transmission harness connector and engine ground.

CHECK ***: Connector & terminal (B12) No. 11 — Engine ground: Is the resistance less than 5 Ω?***

YES : Go to step **10BZ8**.

NO : Repair open circuit in inhibitor switch ground line.



10BZ8	CHECK INHIBITOR SWITCH.

Measure resistance between transmission harness connector receptacle's terminals.

CHECK ***: Connector & terminal (T3) No. 12 — No. 11: Is the resistance less than 1 Ω in "N" and "P" positions?***

YES : Go to next CHECK .

NO : Replace inhibitor switch.

CHECK ***: Is there any fault in selector cable connection to inhibitor switch?***

YES : Repair selector cable connection. <Ref. to 3-2 [W2B2].>

NO : Replace ECM.

OBD (FB1)

P1102

OBD0481

CA: DTC P1102 — PRESSURE SOURCES SWITCHING SOLENOID VALVE CIRCUIT LOW INPUT —

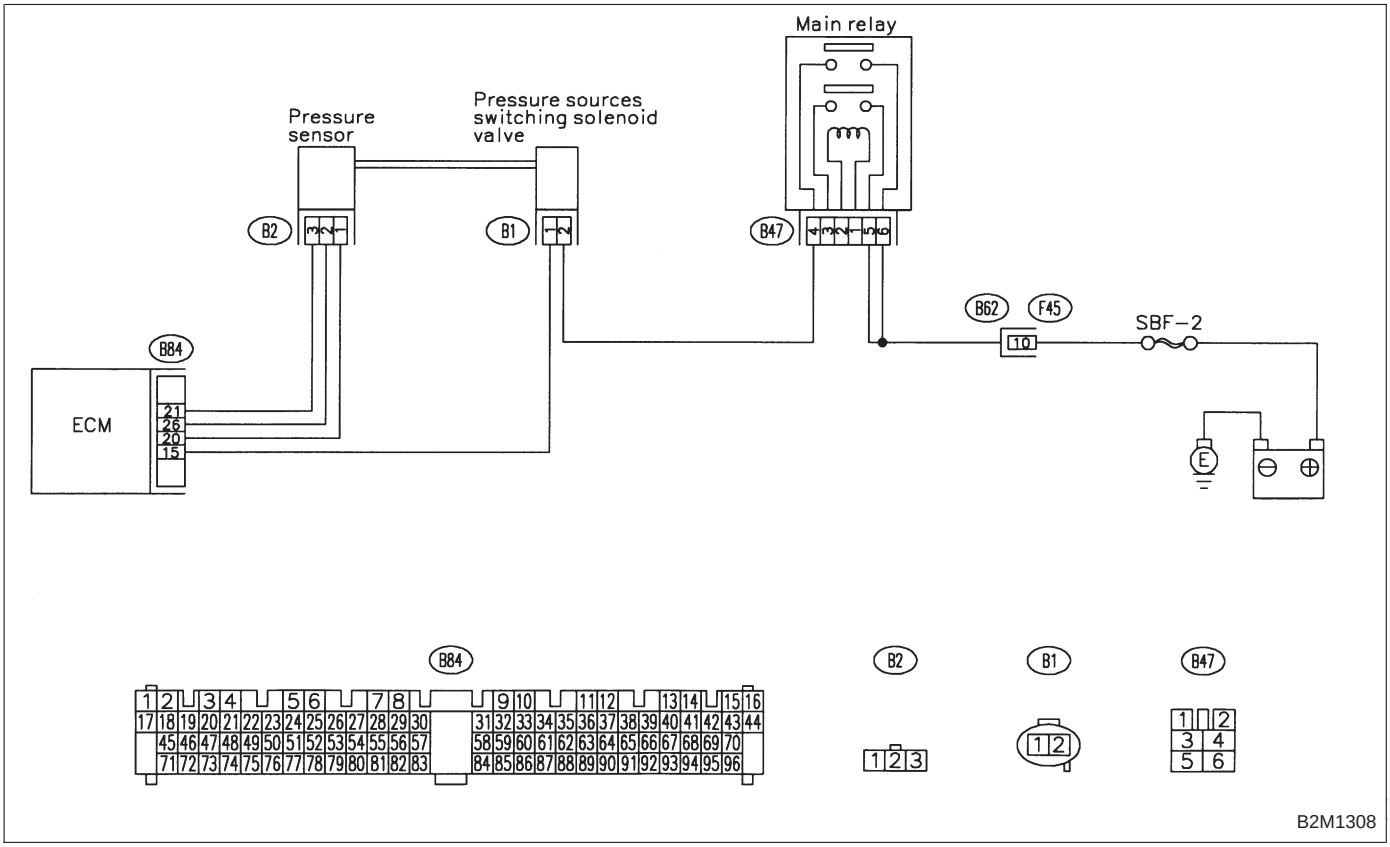
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

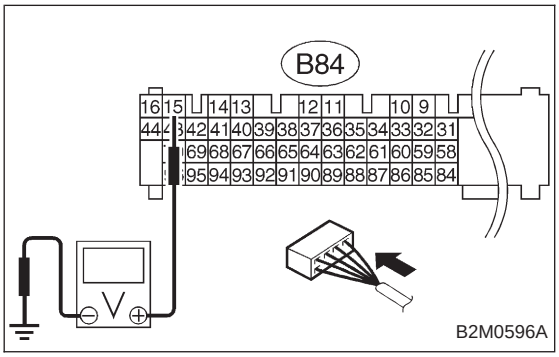
- Erroneous idling
- Failure of engine to start

WIRING DIAGRAM:



B2M1308

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODE.
<Ref. to 2-7 [T3D0] and [T3E0].>



B2M0596A

10CA1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

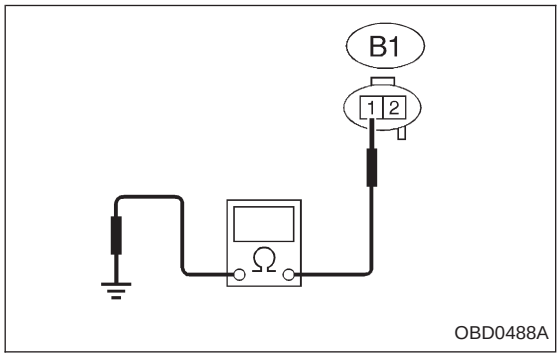
CHECK : ***Connector & terminal (B84) No. 15 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Go to next CHECK .

NO : Go to step **10CA2**.

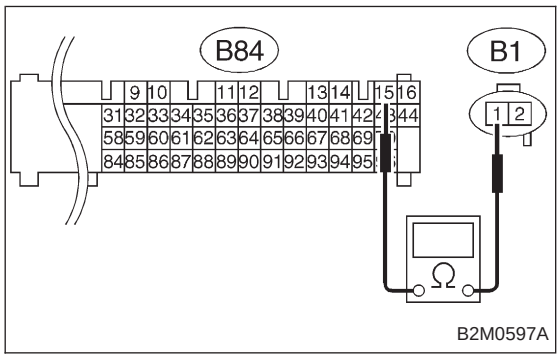
CHECK : ***Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.
NO : Contact with SOA service.
NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

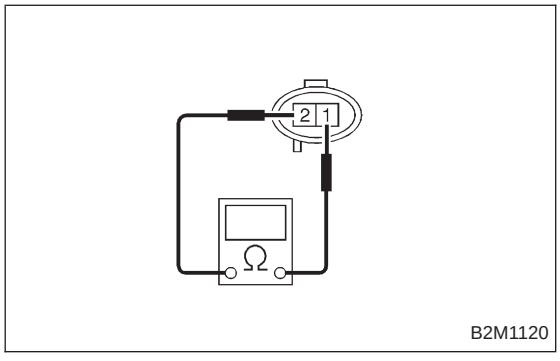


10CA2	CHECK HARNESS BETWEEN ECM AND PRESSURE SOURCES SWITCHING SOLENOID VALVE CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from pressure sources switching solenoid valve and ECM.
3) Measure resistance of harness between pressure sources switching solenoid valve connector and engine ground.
CHECK : ***Connector & terminal***
(B1) No. 1 — Engine ground:
Is the resistance less than 10 Ω?
YES : Repair ground short circuit in harness between ECM and pressure sources switching solenoid valve connector.
NO : Go to next step 4).



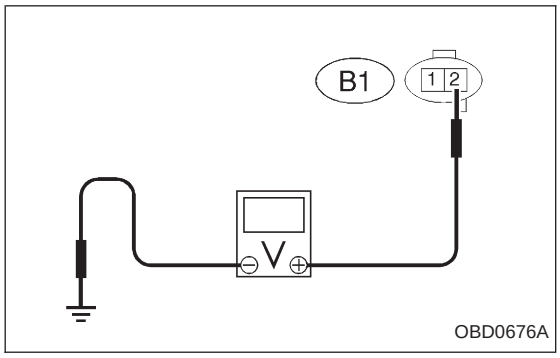
4) Measure resistance of harness between ECM and pressure sources switching solenoid valve connector.
CHECK : ***Connector & terminal***
(B84) No. 15 — (B1) No. 1:
Is the resistance less than 1 Ω?
YES : Go to step **10CA3**.
NO : Repair open circuit in harness between ECM and pressure sources switching solenoid valve connector.



10CA3	CHECK PRESSURE SOURCES SWITCHING SOLENOID VALVE.

Measure resistance between pressure sources switching solenoid valve connector terminals.
CHECK : ***Terminals***
No. 1 — No. 2:
Is the resistance between 10 and 100 Ω?
YES : Go to step **10CA4**.

NO : Replace pressure sources switching solenoid valve.



10CA4	CHECK POWER SUPPLY TO PRESSURE SOURCES SWITCHING SOLENOID VALVE.

1) Turn ignition switch to ON.
2) Measure voltage between pressure sources switching solenoid valve harness connector and engine ground.

CHECK ***: Connector & terminal (B1) No. 2 (+) — Engine ground (−): Is the voltage more than 10 V?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between main relay and pressure sources switching solenoid valve connector.

CHECK ***: Is there poor contact in pressure sources switching solenoid valve connector?***

YES : Repair poor contact in pressure sources switching solenoid valve connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

OBD (FB1)

P1103 <TRQ>

OBD0489

CB: DTC P1103 — ENGINE TORQUE CONTROL SIGNAL CIRCUIT MALFUNCTION —

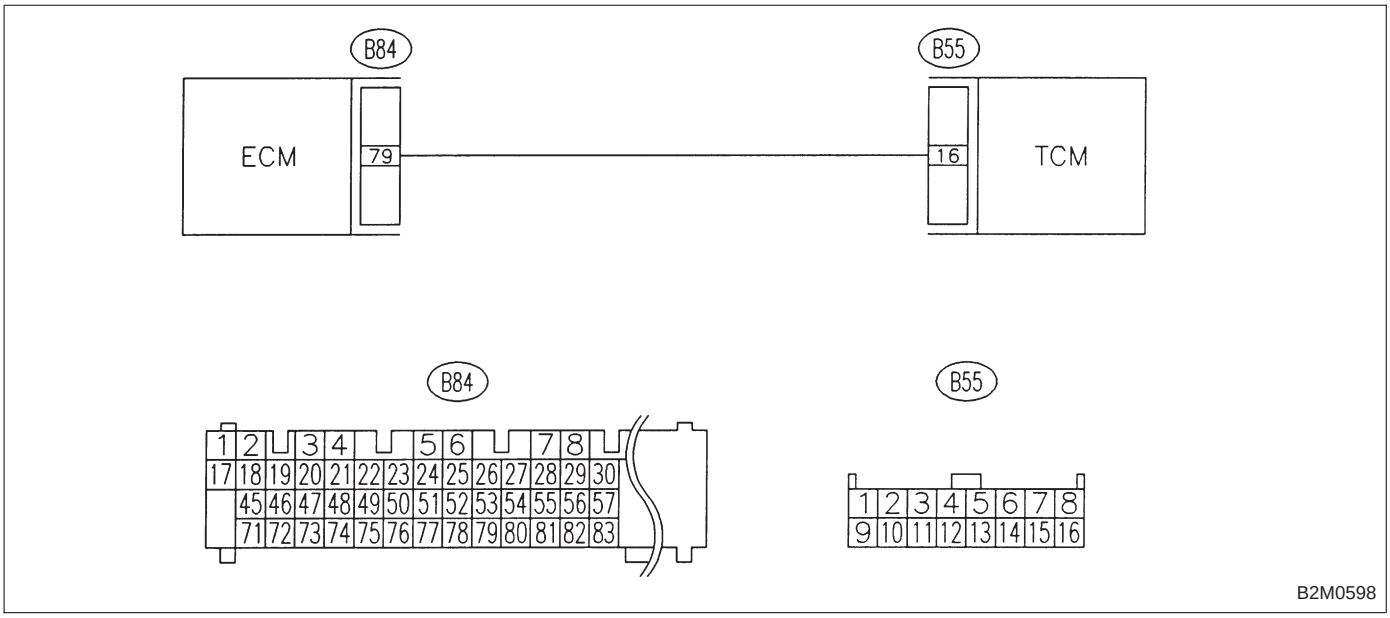
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

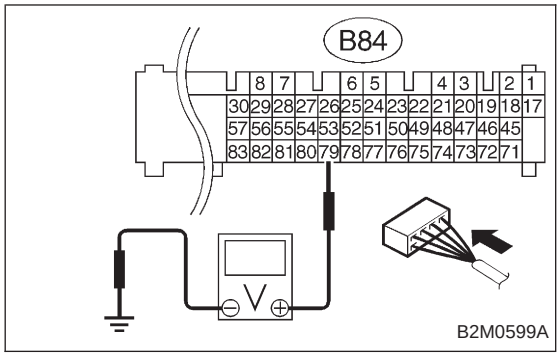
- Excessive shift shock

WIRING DIAGRAM:



B2M0598

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10CB1	CHECK INPUT SIGNAL FOR ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 79 (+) — Chassis ground (−): Is the voltage more than 4.5 V?***

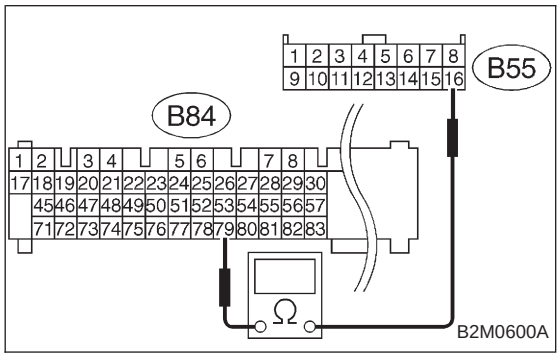
YES : Go to next CHECK .

NO : Go to step **10CB2**.

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



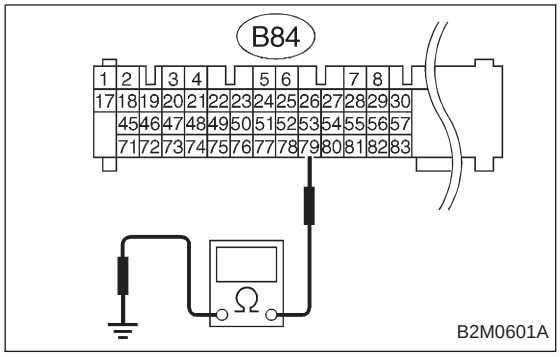
10CB2	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connectors from ECM and TCM.
3) Measure resistance of harness between ECM and TCM connector.

CHECK ***: Connector & terminal (B84) No. 79 — (B55) No. 16: Is the resistance less than 1 Ω?***

YES : Go to next step 4).

NO : Repair open circuit in harness between ECM and TCM connector.



4) Measure resistance of harness between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 79 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between ECM and TCM connector.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in TCM connector?***

YES : Repair poor contact in TCM connector.

NO : Replace TCM.

OBD (FB1)

P1104 <TCS_LOW>

B2M1121

CC: DTC P1104 — TCS SIGNAL CIRCUIT LOW INPUT —

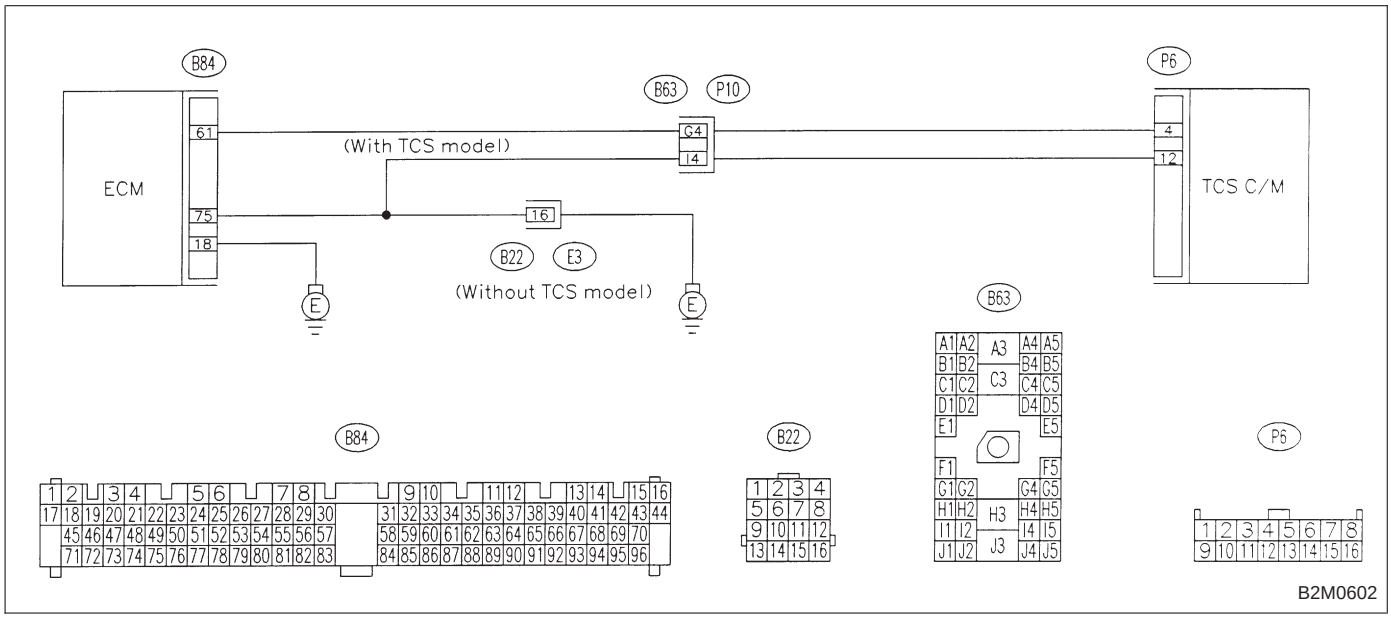
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

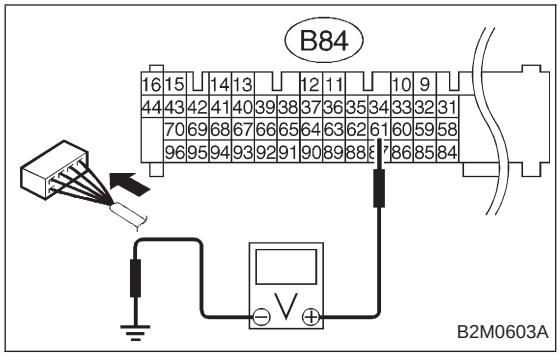
- No operation TCS
- TCS warning light remains illuminated.

WIRING DIAGRAM:



B2M0602

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



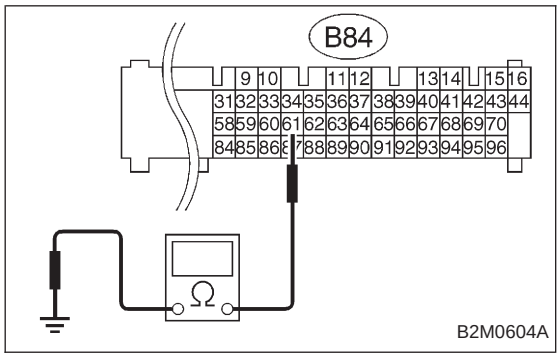
10CC1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 61 (+) — Chassis ground (−): Is the voltage more than 2 V?***

YES : Repair poor contact in ECM connector.

NO : Go to step **10CC2**.



10CC2	CHECK HARNESS BETWEEN ECM AND TCS C/M CONNECTOR.

1) Turn ignition switch to OFF.
2) Remove front passenger side seat.
3) Tear off the floor mat.
4) Disconnect connectors from ECM and TCS C/M.
5) Measure resistance of harness between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 61 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between ECM and TCS C/M connector.

NO : Replace TCS C/M.

OBD (FB1)

P1120 <ST_SWON>

B2M1122

CD: DTC P1120 — STARTER SWITCH CIRCUIT HIGH INPUT —

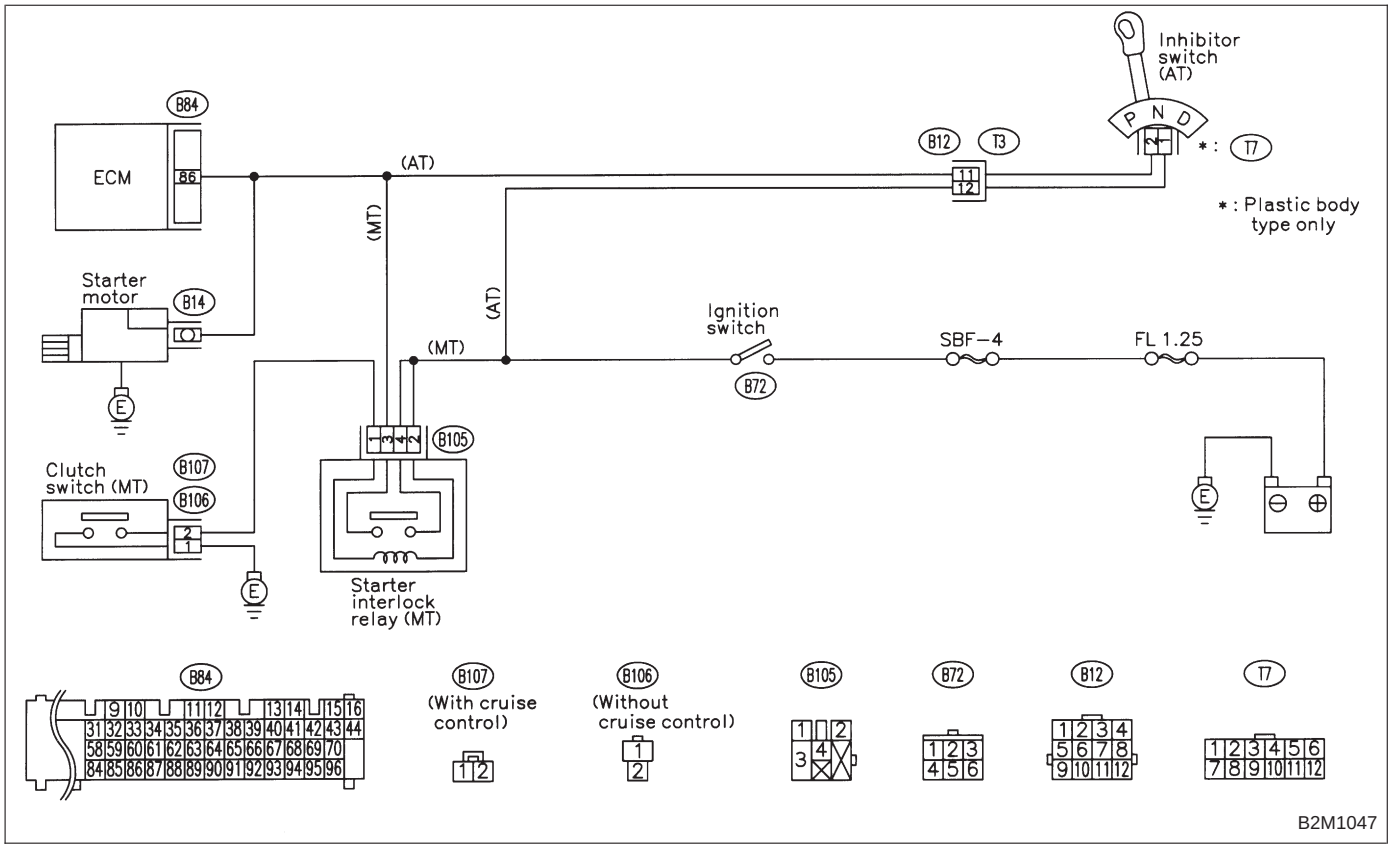
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Failure of engine to start

WIRING DIAGRAM:



B2M1047

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10CD1	**CHECK OPERATION OF STARTER MOTOR.**

CHECK ***: Does starter motor operate when ignition switch to "ON"?***

NOTE:
- On AT vehicles, place the inhibitor switch in each position.
- On MT vehicles, depress or release the clutch pedal.

YES : Repair battery short circuit in starter motor circuit. After repair, replace ECM.

NO : Check starter motor circuit. <Ref. to 2-7 [T8B0].>

OBD (FB1)
P1121 <N_SWON>
B2M1123

CE: DTC P1121 — NEUTRAL POSITION SWITCH CIRCUIT LOW INPUT [AT VEHICLES] —

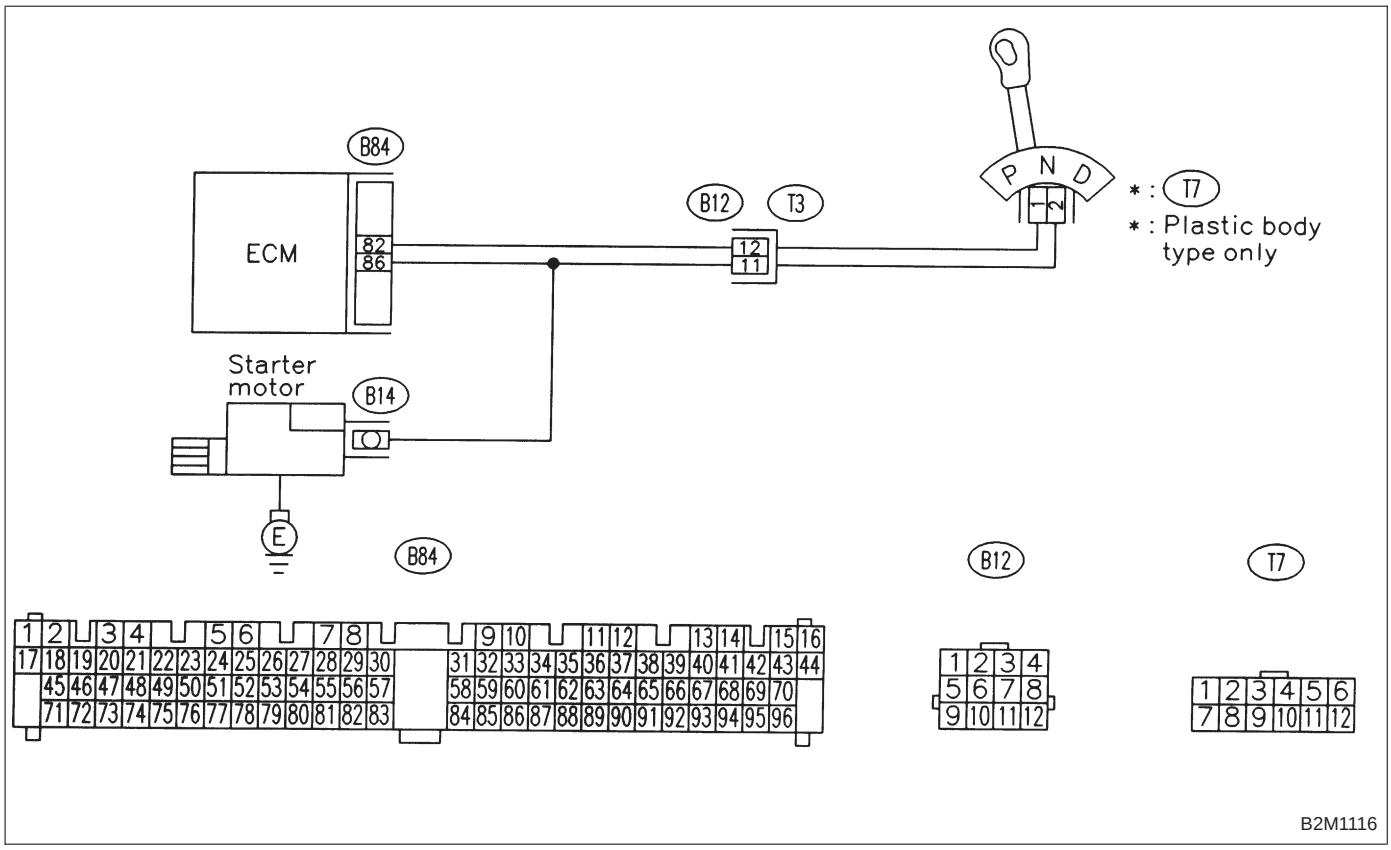
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Erroneous idling

WIRING DIAGRAM:



B2M1116

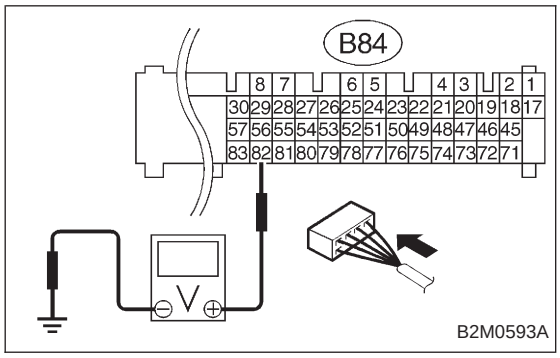
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10CE1	CHECK DTC P0705 ON DISPLAY.

CHECK : ***Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0705?***

YES : Inspect DTC P0705 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NO : Go to step **10CE2**.



10CE2	CHECK INPUT SIGNAL FOR ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK : ***Connector & terminal (B84) No. 82 (+) — Chassis ground (−): Is the voltage between 4.5 and 5.5 V in other positions?***

YES : Even if MIL lights up, the circuit has returned to a normal condition at this time.

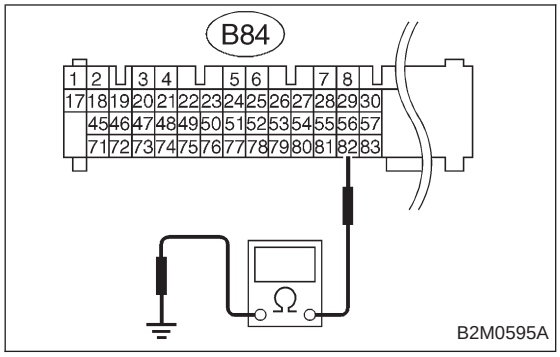
NO : Go to step **10CE3**.

10CE3	CHECK INHIBITOR SWITCH TYPE.

CHECK : ***Is inhibitor switch type plastic body?***

YES : Go to step **10CE4**.

NO : Go to step **10CE7**.



10CE4	CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connectors from ECM and transmission harness connector.
3) Measure resistance of harness between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 82 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between ECM and transmission harness connector.

NO : Go to step **10CE5**.

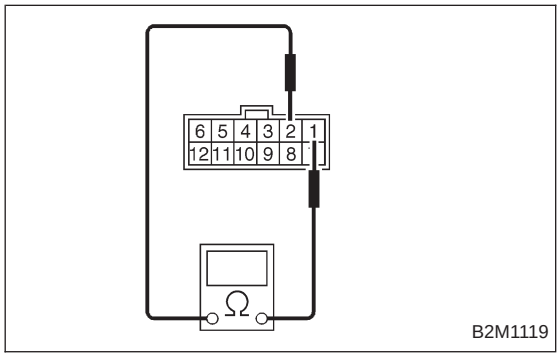
10CE5	CHECK TRANSMISSION HARNESS CONNECTOR.

1) Disconnect connector from inhibitor switch.
2) Measure resistance of harness between transmission harness connector and engine ground.

CHECK ***: Connector & terminal (T3) No. 12 — Engine ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between transmission harness and inhibitor switch connector.

NO : Go to step **10CE6**.



10CE6	CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

CHECK ***: Terminals No. 1 — No. 2: Is the resistance more than 1 MΩ in other positions?***

YES : Go to next CHECK .

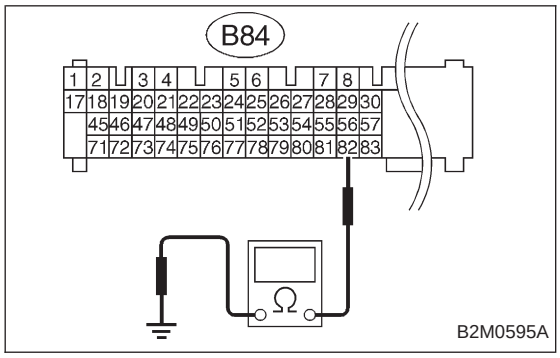
NO : Replace inhibitor switch.

CHECK ***: Is there any fault in selector cable connection to inhibitor switch?***

YES : Repair selector cable connection. <Ref. to 3-2 [W2B2].>

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.



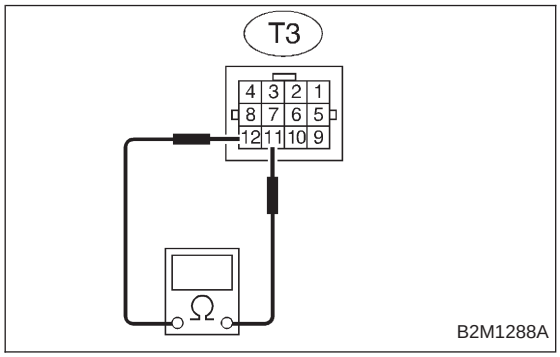
10CE7	CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connectors from ECM and transmission harness connector.
3) Measure resistance of harness between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 82 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair short circuit in harness between ECM and transmission harness connector.

NO : Go to step **10CE8**.



10CE8	CHECK INHIBITOR SWITCH.

Measure resistance between transmission harness connector receptacle's terminals.

CHECK ***: Connector & terminal (T3) No. 12 — No. 11: Is the resistance more than 1 MΩ in other positions?***

YES : Go to next CHECK .

NO : Replace inhibitor switch.

CHECK ***: Is there any fault in selector cable connection to inhibitor switch?***

YES : Repair selector cable connection. <Ref. to 3-2 [W2B2].>

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

OBD (FB1)
P1122 <BR_HI>
B2M1124

CF: DTC P1122 — PRESSURE SOURCES SWITCHING SOLENOID VALVE CIRCUIT HIGH INPUT —

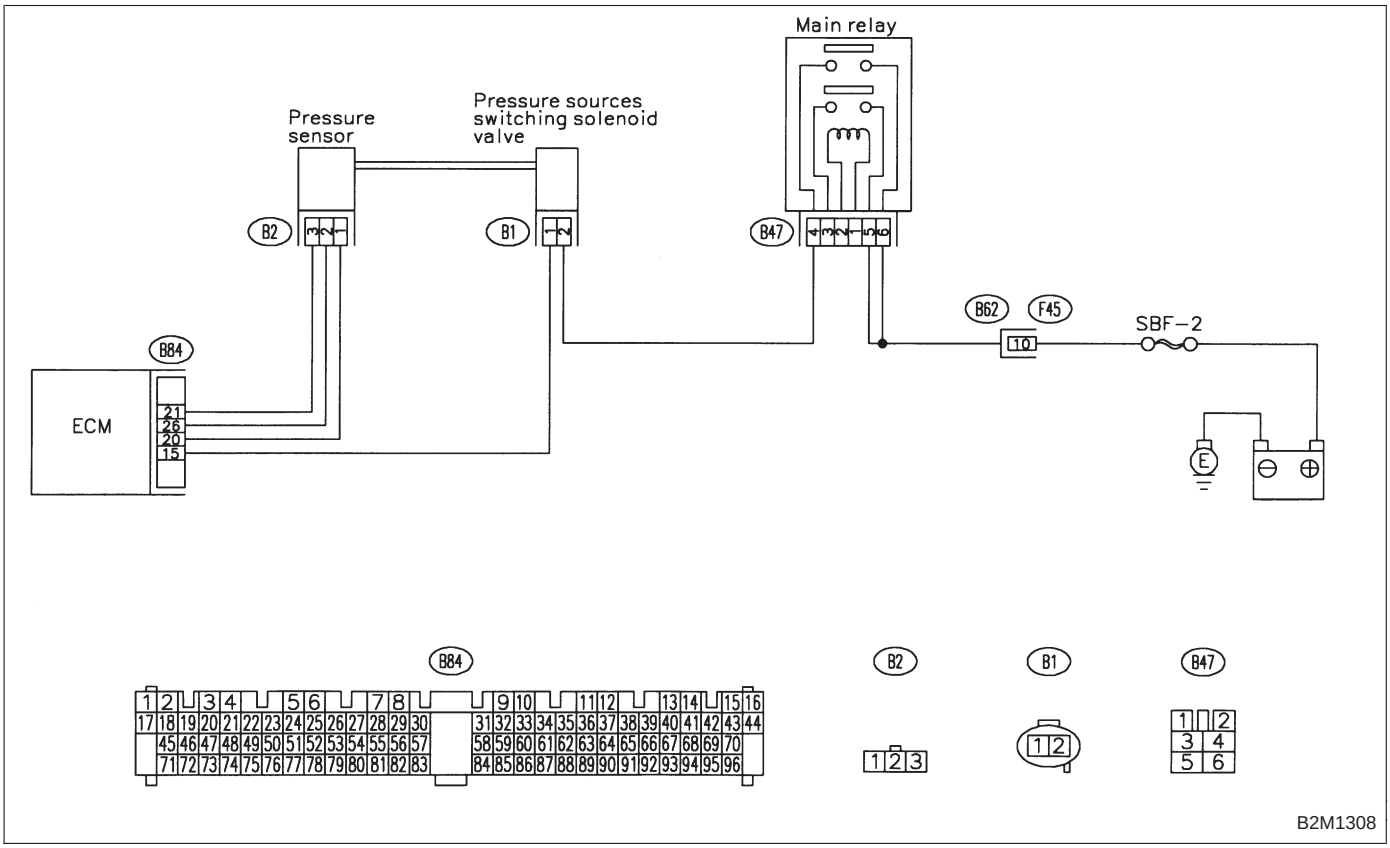
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

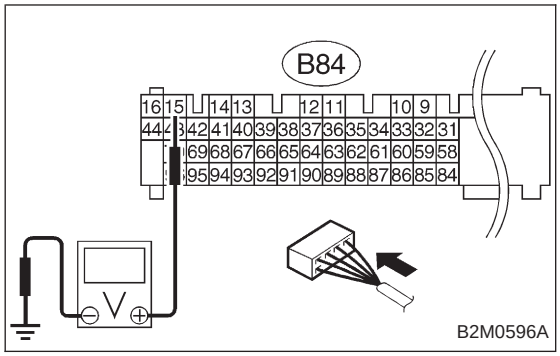
TROUBLE SYMPTOM:

- Erroneous idling
- Failure of engine to start

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODE.
<Ref. to 2-7 [T3D0] and [T3E0].>



10CF1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 15 (+) — Chassis ground (−): Is the voltage more than 10 V?***

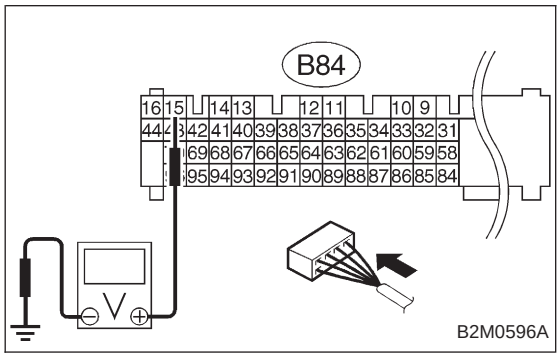
YES : Go to step **10CF2**.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



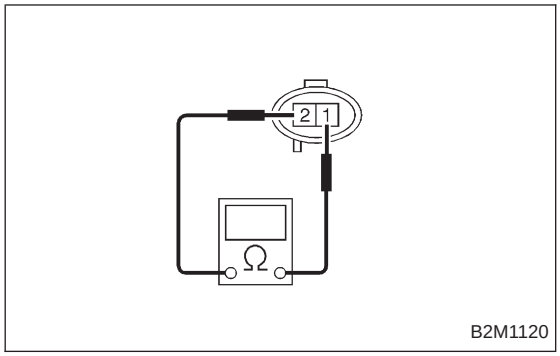
10CF2	CHECK HARNESS BETWEEN ECM AND PRESSURE SOURCES SWITCHING SOLENOID VALVE CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from pressure sources switching solenoid valve.
3) Turn ignition switch to ON.
4) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 15 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and pressure sources switching solenoid valve connector. After repair, replace ECM.

NO : Go to next step 5).



5) Turn ignition switch to OFF.
6) Measure resistance between pressure sources switching solenoid valve connector terminals.

CHECK ***: Terminals No. 1 — No. 2: Is the resistance less than 1 Ω?***

YES : Replace pressure sources switching solenoid valve and ECM.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.

OBD (FB1)
P1124 <TCS_HI>
B2M1125

CG: DTC P1124
— TCS SIGNAL CIRCUIT HIGH INPUT —

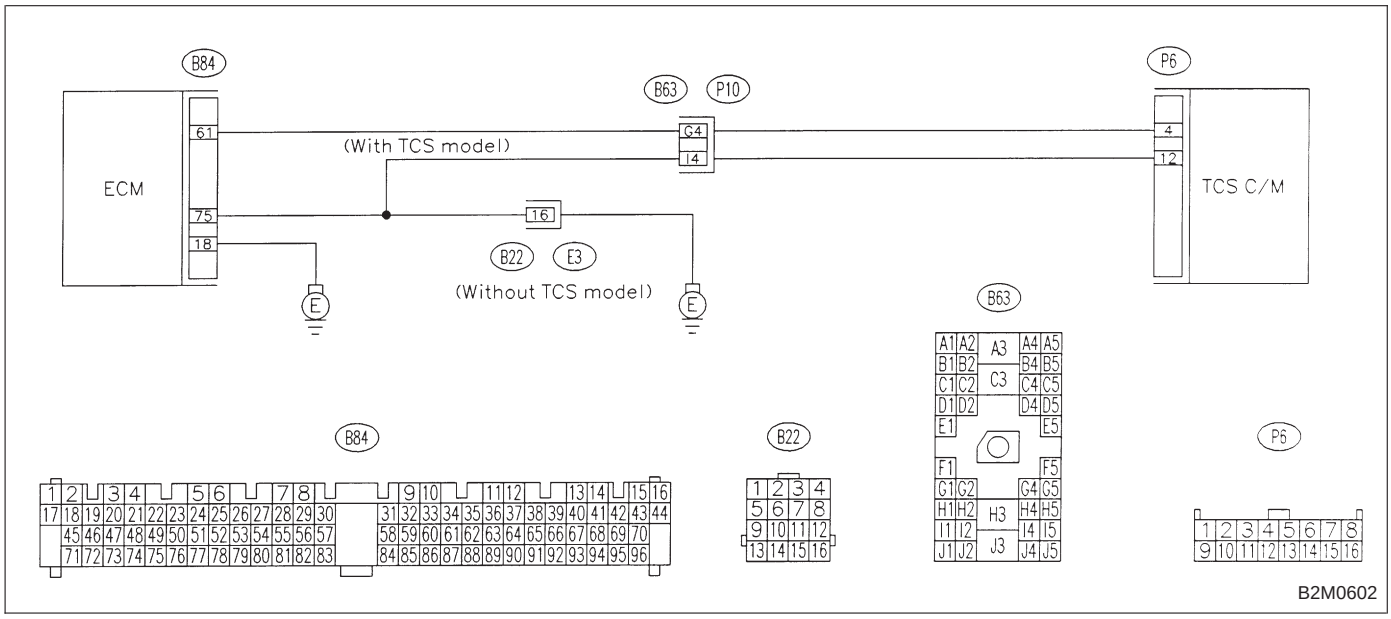
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- No operation TCS
- TCS warning light remains illuminated.

WIRING DIAGRAM:



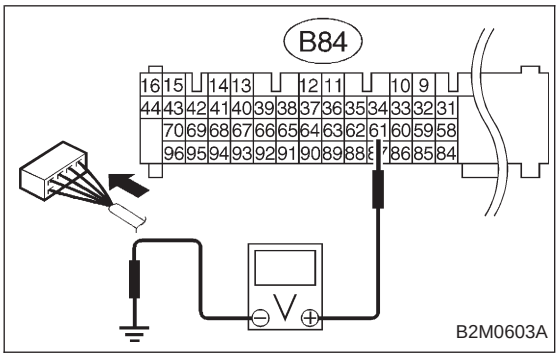
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10CG1	CHECK IF THE VEHICLE IS EQUIPPED WITH TCS.

CHECK ***: Is the vehicle equipped with TCS?***

YES : Go to step **10CG2**.

NO : Go to step **10CG5**.



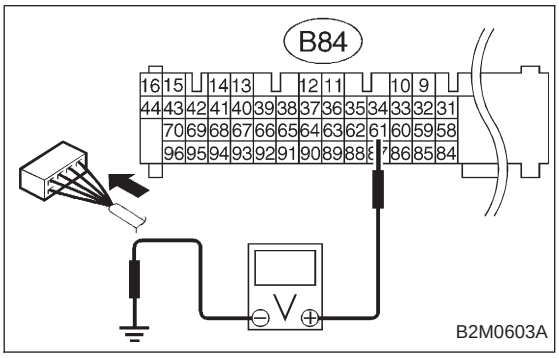
10CG2	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 61 (+) — Chassis ground (−): Is the voltage more than 2 V?***

YES : Go to step **10CG3**.

NO : Go to step **10CG4**.



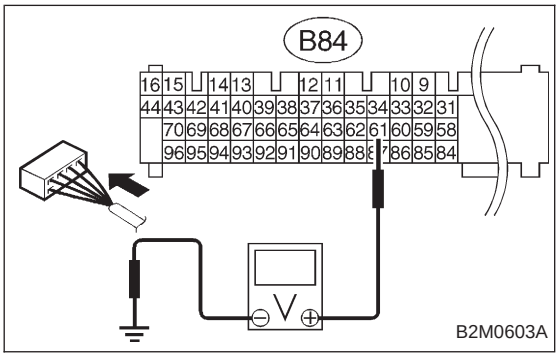
10CG3	CHECK HARNESS BETWEEN ECM AND TCS C/M CONNECTOR.

1) Turn ignition switch to OFF.
2) Remove front passenger side seat.
3) Tear off the floor mat.
4) Disconnect connectors from ECM and TCS C/M.
5) Measure voltage between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 61 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and TCS C/M connector.

NO : Go to next step 6).

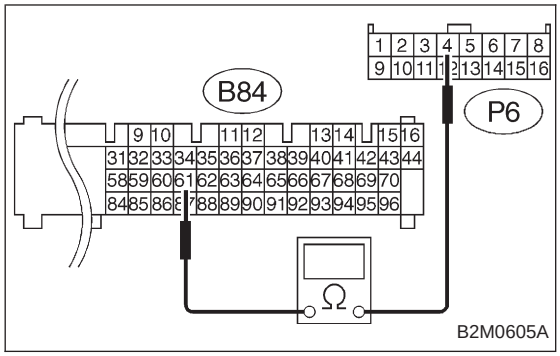


6) Turn ignition switch to ON.
7) Measure voltage between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 61 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and TCS C/M connector.

NO : Repair poor contact in ECM connector.



10CG4	CHECK HARNESS BETWEEN ECM AND TCS C/M CONNECTOR.

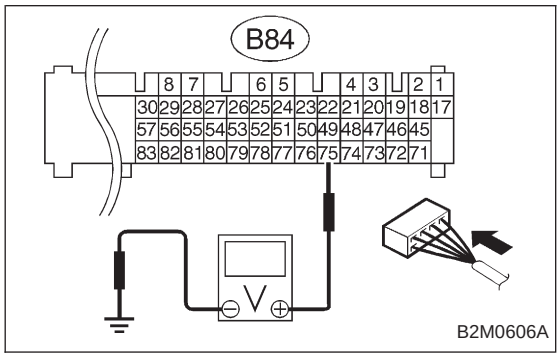
1) Turn ignition switch to OFF.
2) Remove front passenger side seat.
3) Tear off the floor mat.
4) Disconnect connectors from ECM and TCS C/M.
5) Measure resistance of harness between ECM and TCS C/M connector.

CHECK ***: Connector & terminal (B84) No. 61 — (P6) No. 4: Is the resistance less than 1 Ω?***

YES : Repair poor contact in TCS C/M connector.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and TCS C/M connector
- Poor contact in ECM connector
- Poor contact in TCS C/M connector
- Poor contact in S.M.J. connector (B63)



10CG5	CHECK ECM CONNECTOR.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 75 (+) — Chassis ground (−): Is the voltage more than 2 V?***

YES : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM connector and engine grounding terminal
- Poor contact in engine grounding terminal
- Poor contact in coupling connector (B22)

NO : Repair poor contact in ECM connector.

OBD (FB1)

P1141 <QA_RHI>

B2M1126

CH: DTC P1141 — MASS AIR FLOW SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) —

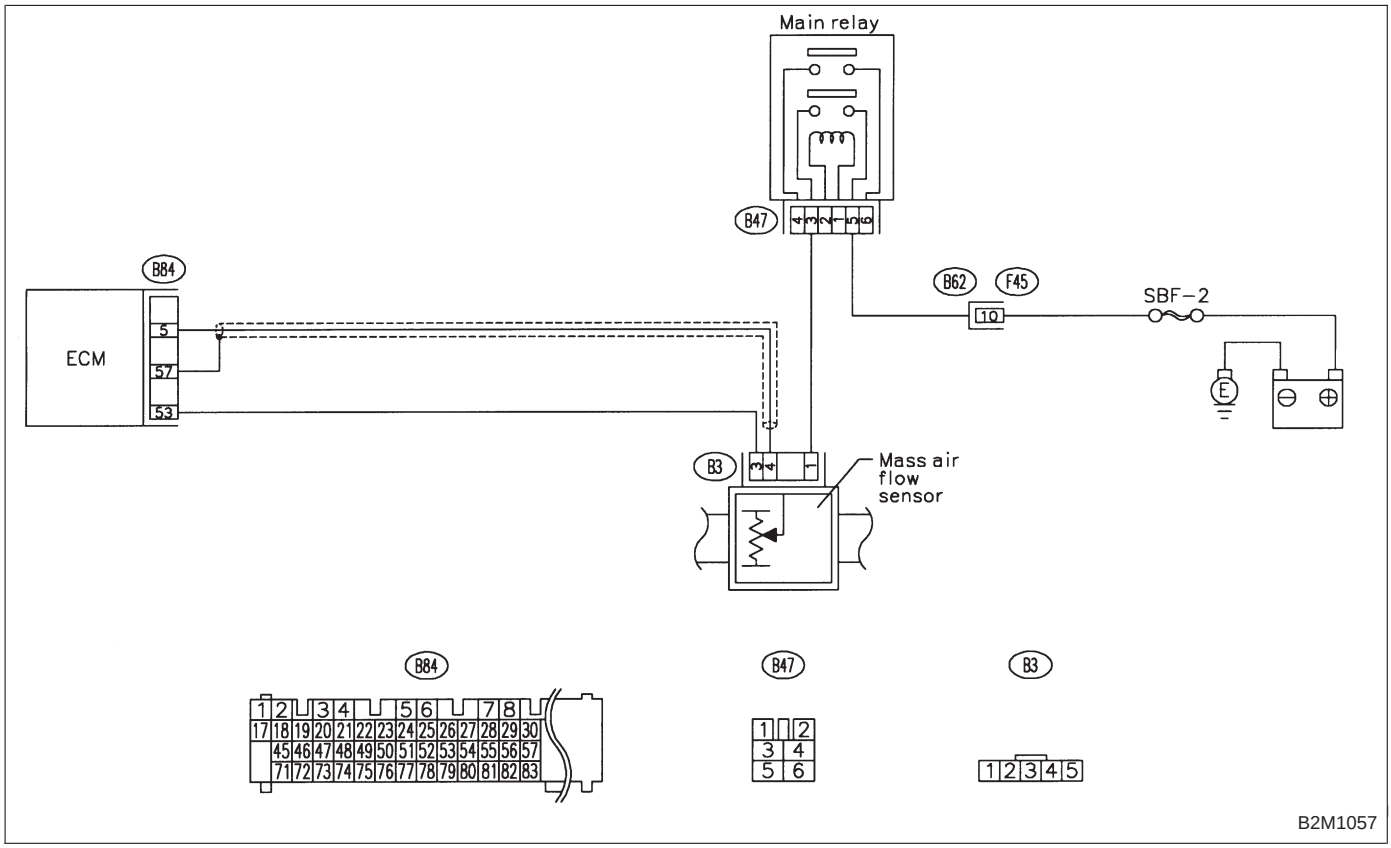
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10CH1	**CHECK DTC P0102 OR P0103 ON DISPLAY.**

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0102 or P0103?***

YES : Inspect DTC P0102 or P0103 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect DTC P1141.

NO : Replace mass air flow sensor.

OBD (FB1)

P1142 <TH_RLOW>

B2M1127

CI: DTC P1142 — THROTTLE POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) —

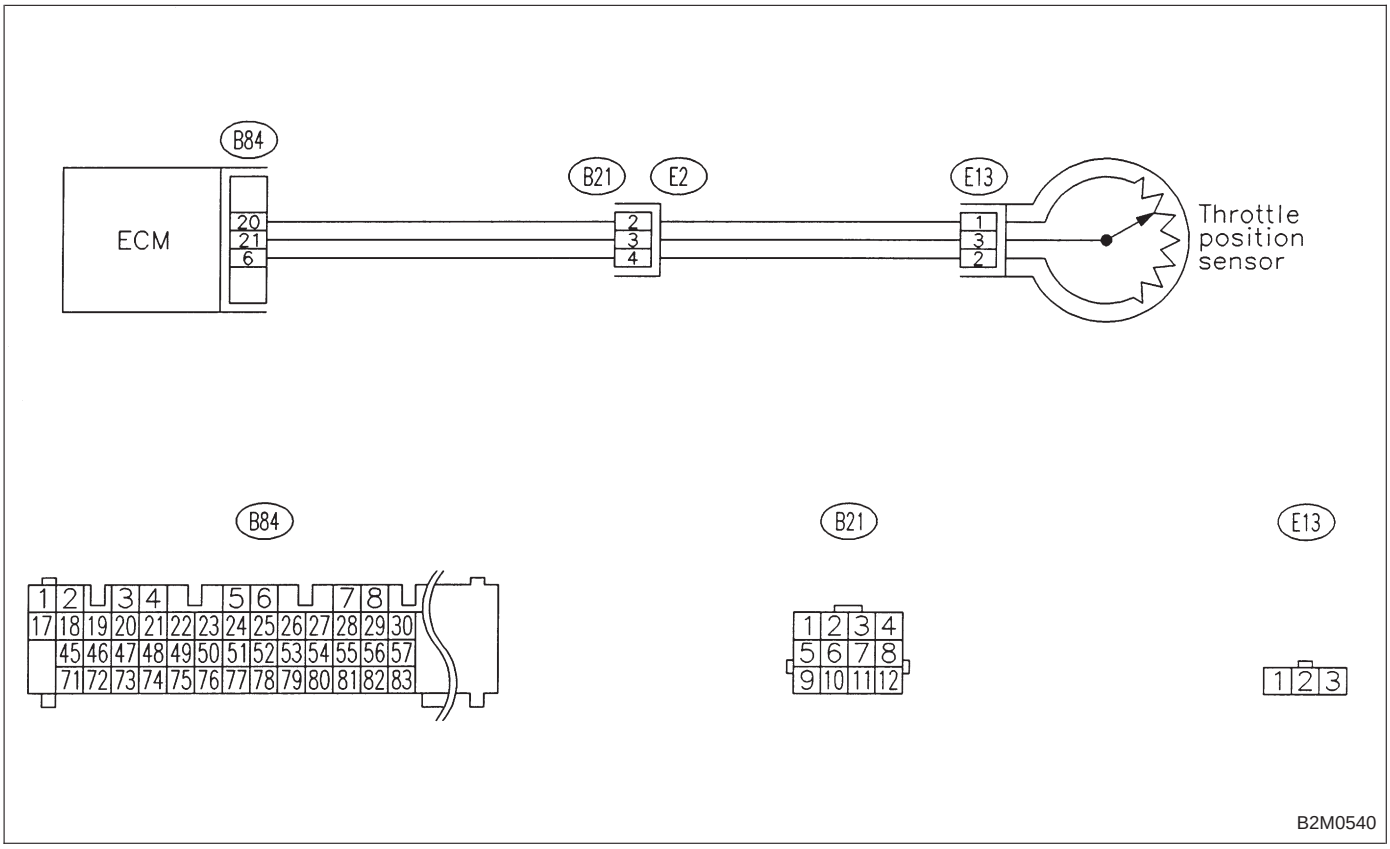
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

WIRING DIAGRAM:



B2M0540

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10CI1	**CHECK DTC P0122 OR P0123 ON DISPLAY.**

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0122 or P0123?***

YES : Inspect DTC P0122 or P0123 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect DTC P1142.

NO : Replace throttle position sensor.

OBD (FB1)

P1143 <PS_RLOW>

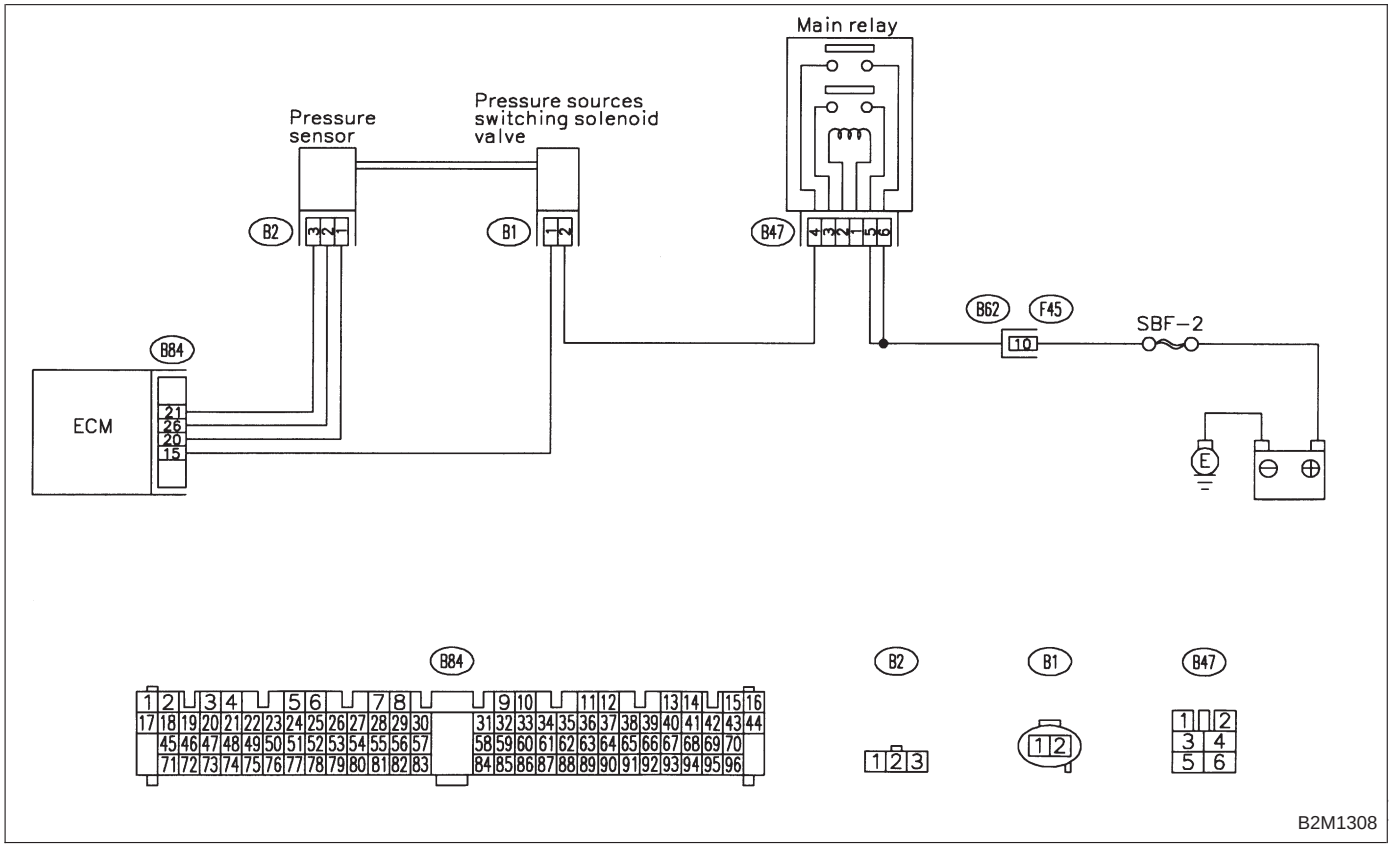
B2M1128

CJ: DTC P1143 — PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) —

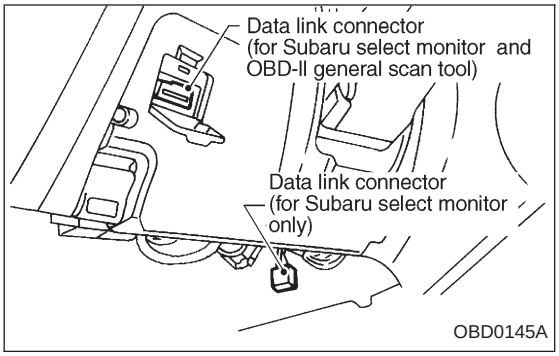
DTC DETECTING CONDITION:

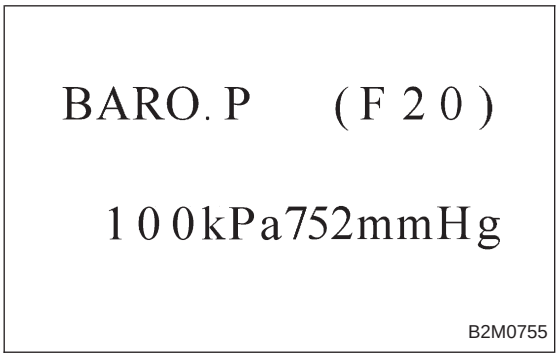
- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>





10CJ1	CHECK DATA FOR CONTROL.

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch ON and Subaru Select Monitor or the OBD-II general scan tool switch ON.
4) Start engine.
5) Read data on Subaru Select Monitor or the OBD-II general scan tool.

● Subaru Select Monitor
Designate mode using function key.

Function mode: F20

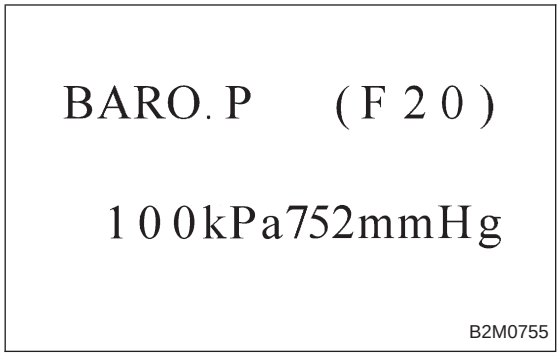
● F20: Display shows pressure signal value sent from the pressure sensor.

CHECK ***: Is the value less than 32 kPa in function mode F20?***

YES : Go to step **10CJ3**.

NO : Go to step **10CJ2**.

● OBD-II general scan tool
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



10CJ2	CHECK PRESSURE SENSOR.

1) Measure actual atmospheric pressure.
2) Read data on Subaru Select Monitor or OBD-II general scan tool.
● Subaru Select Monitor
Designate mode using function key.

Function mode: F20

● F20: Display shows pressure signal value sent from the pressure sensor.

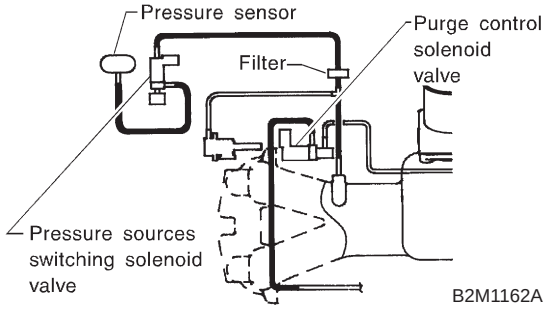
CHECK ***: Is the difference between absolute value of Subaru Selector Monitor indication and actual atmospheric pressure greater than 10 kPa (0.102 kg/cm^2, 1.45 psi)?***

YES : Replace pressure sensor.

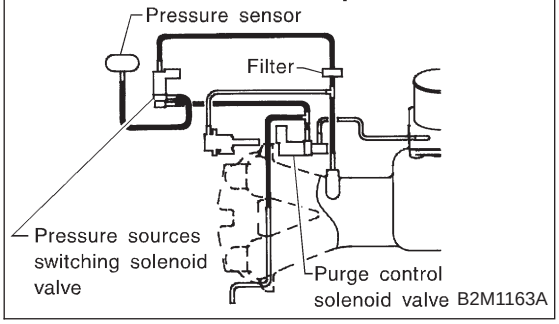
NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

2200 cc AWD except Taiwan spec. vehicles



2200 cc FWD and Taiwan spec. vehicles



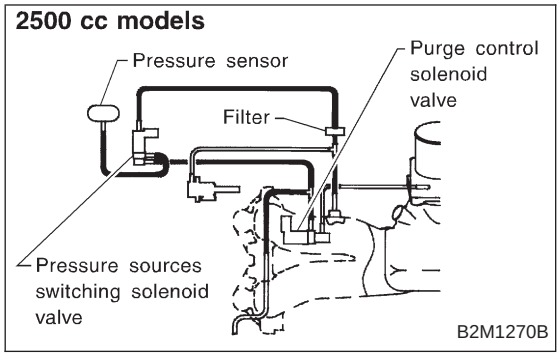
10CJ3	CHECK VACUUM HOSE.

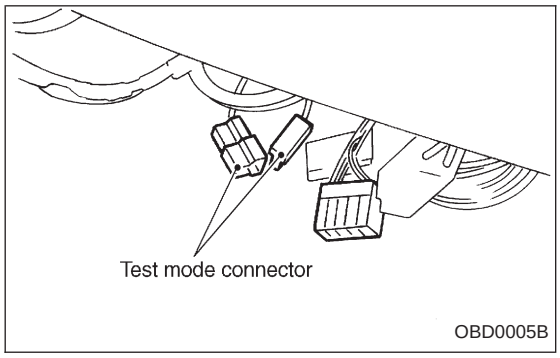
CHECK ***: Is there a fault in vacuum hose?***

NOTE:
Check the following item.
Incorrect hose connections in line between the pressure sources switching solenoid valve and pressure sensor, intake manifold and/or CPC solenoid valve.

YES : Repair or replace hoses or filter.

NO : Go to step **10CJ4**.





10CJ4	CHECK PRESSURE SOURCES SWITCHING SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Connect test mode connector.
3) Turn ignition switch to ON.

CHECK ***: Does pressure sources switching solenoid valve produce operating sound? (ON ↔ OFF each 1.5 sec.)***

NOTE:
Pressure sources switching solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD10). For the procedure, refer to “COMPULSORY VALVE OPERATION CHECK MODE”. <Ref. to 2-7 [T3F0].>

YES : Replace pressure sensor.

NO : Replace pressure sources switching solenoid valve.

OBD (FB1)

P1144 <PS_RHI>

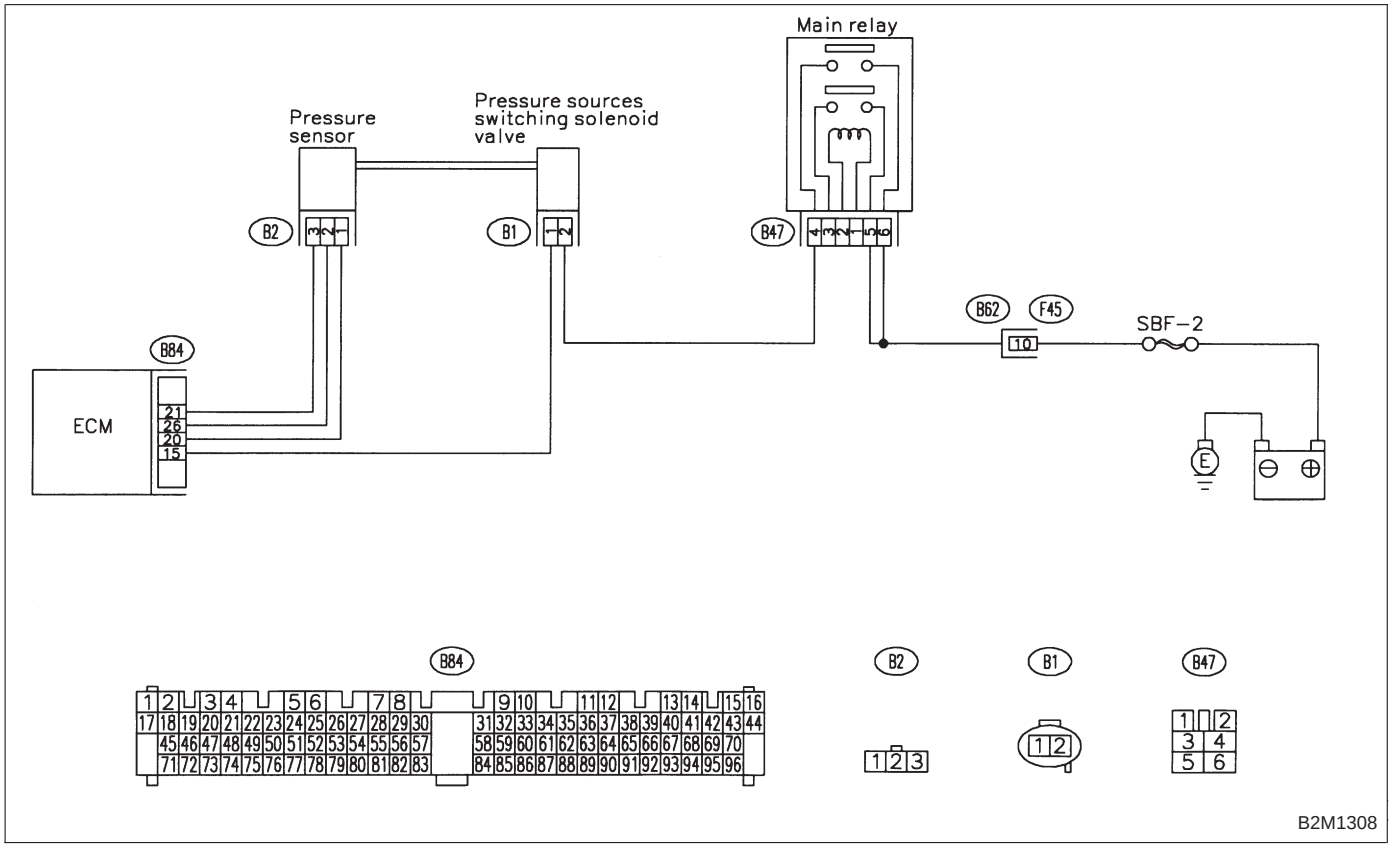
B2M1129

CK: DTC P1144 — PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) —

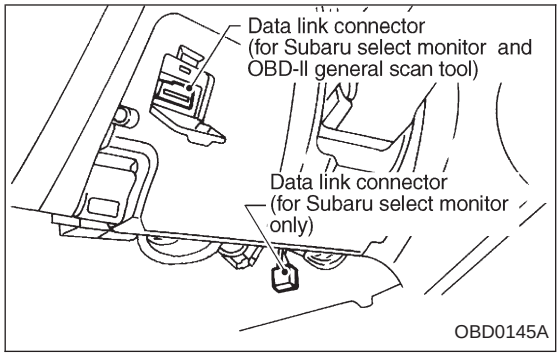
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



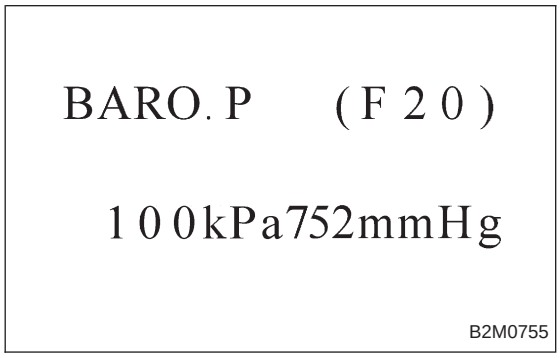
10CK1	CHECK DATA FOR CONTROL.

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch ON and Subaru Select Monitor or the OBD-II general scan tool switch ON.
4) Start engine.
5) Read data on Subaru Select Monitor or the OBD-II general scan tool.

● Subaru Select Monitor
Designate mode using function key.

Function mode: F20

● F20: Display shows pressure signal value sent from the pressure sensor.



CHECK ***: Is the value more than 133 kPa in function mode F20?***

YES : Replace pressure sensor.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

● OBD-II general scan tool
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

OBD (FB1)

P1400<PCVSOL_LO>

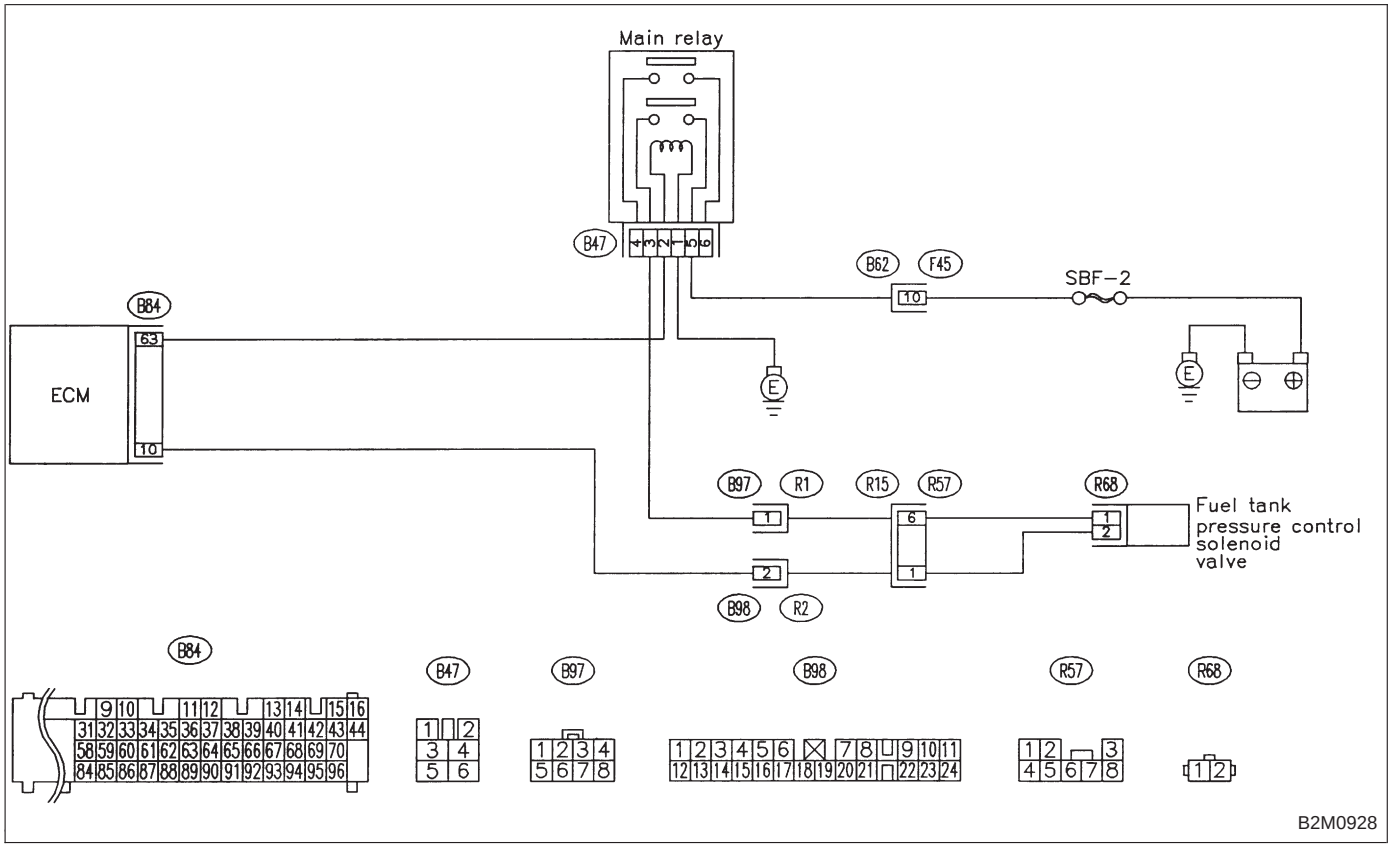
B2M1130

CL: DTC P1400 — FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW INPUT —

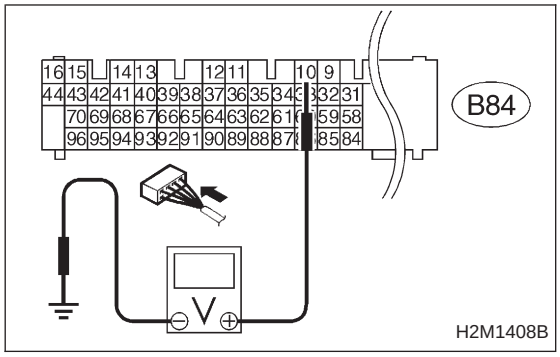
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10CL1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 10 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Go to next CHECK .

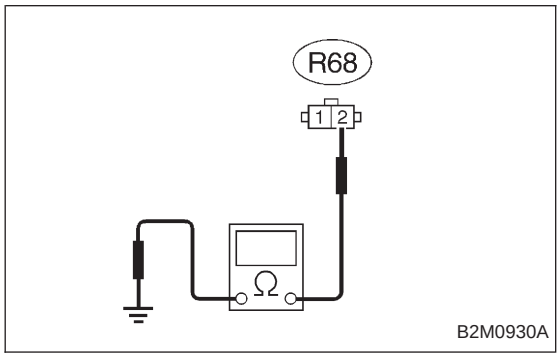
NO : Go to step **10CL2**.

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.



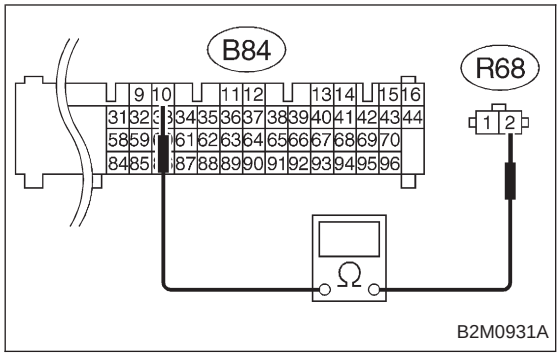
10CL2	CHECK HARNESS BETWEEN FUEL TANK PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connectors from fuel tank pressure control solenoid valve and ECM.
3) Measure resistance of harness between fuel tank pressure control solenoid valve connector and chassis ground.

CHECK ***: Connector & terminal (R68) No. 2 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between ECM and fuel tank pressure control solenoid valve connector.

NO : Go to next step 4).



4) Measure resistance of harness between ECM and fuel tank pressure control solenoid valve connector.

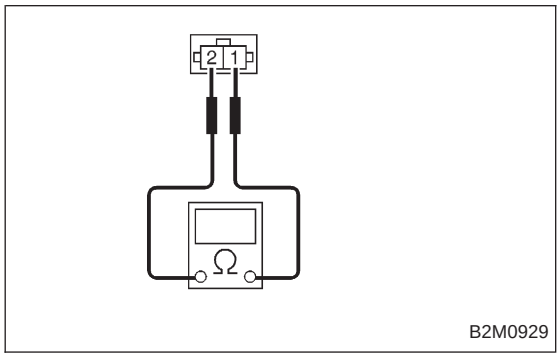
CHECK ***: Connector & terminal (B84) No. 10 — (R68) No. 2: Is the voltage less than 1 Ω?***

YES : Go to step **10CL3**.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:

- Open circuit in harness between ECM and fuel tank pressure control solenoid valve connector
- Poor contact in coupling connectors (B98 and R57)



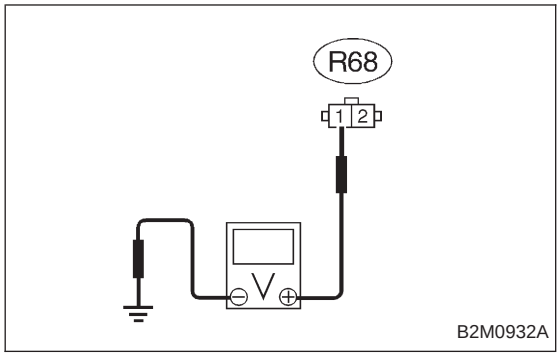
10CL3	CHECK FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

Measure resistance between fuel tank pressure control solenoid valve terminals.

CHECK ***: Terminals No. 1 — No. 2: Is the resistance between 10 and 100 Ω?***

YES : Go to step **10CL4**.

NO : Replace fuel tank pressure control solenoid valve.



10CL4	**CHECK POWER SUPPLY TO FUEL TANK PRESSURE CONTROL SOLENOID VALVE.**

1) Turn ignition switch to ON.
2) Measure voltage between fuel tank pressure control solenoid valve and chassis ground.

CHECK ***: Connector & terminal (R68) No. 1 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between main relay and fuel tank pressure control solenoid valve connector
- Poor contact in coupling connectors (B97 and R57)
- Poor contact in main relay connector

CHECK ***: Is there poor contact in fuel tank pressure control solenoid valve connector?***

YES : Repair poor contact in fuel tank pressure control solenoid valve connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

OBD (FB1)

P1420<PCVSOL_HI>

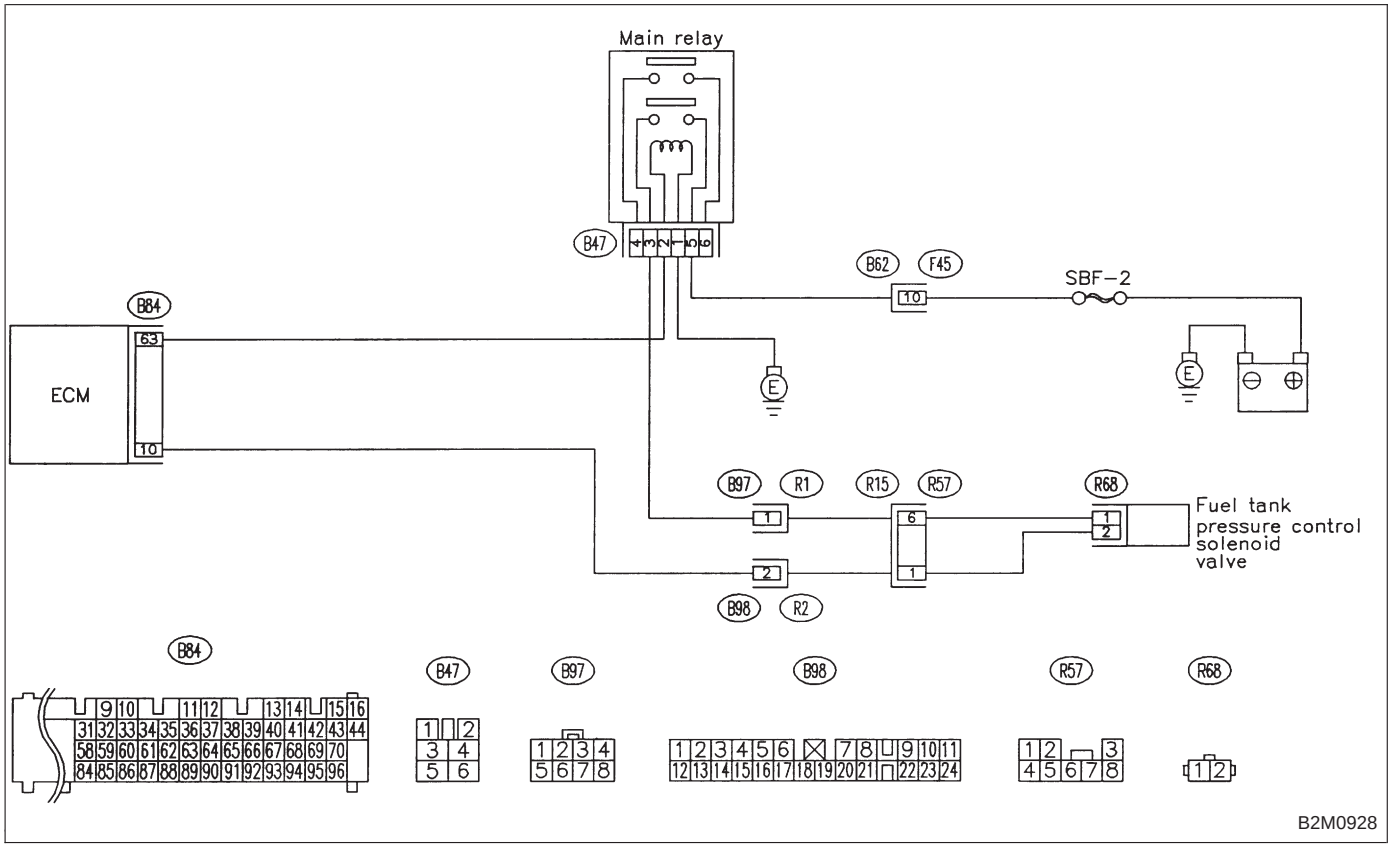
B2M1131

CM: DTC P1420 — FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT HIGH INPUT —

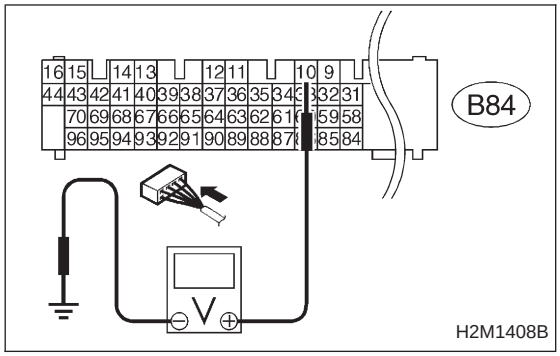
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10CM1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 10 (+) — Chassis ground (−): Is the voltage more than 10 V?***

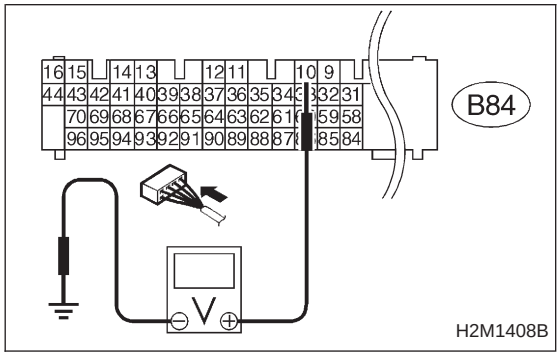
YES : Go to step **10CM2**.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



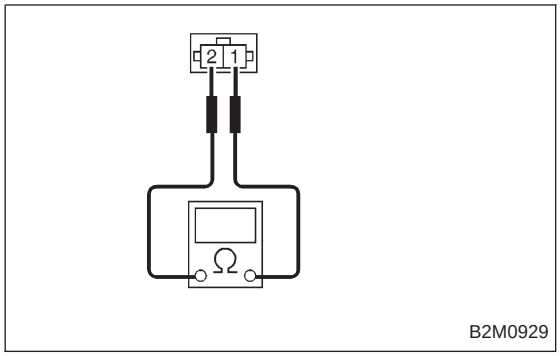
10CM2	CHECK HARNESS BETWEEN FUEL TANK PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from fuel tank pressure control solenoid valve.
3) Turn ignition switch to ON.
4) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 10 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and fuel tank pressure control solenoid valve connector. After repair, replace ECM.

NO : Go to next step 5).



5) Turn ignition switch to OFF.
6) Measure resistance between fuel tank pressure control solenoid valve terminals.

CHECK ***: Terminals No. 1 — No. 2: Is the resistance less than 1 Ω?***

YES : Replace fuel tank pressure control solenoid valve and ECM.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.

OBD (FB1)

P1421<EGRSOL_HI>

B2M1132

CN: DTC P1421 — EXHAUST GAS RECIRCULATION CIRCUIT HIGH INPUT —

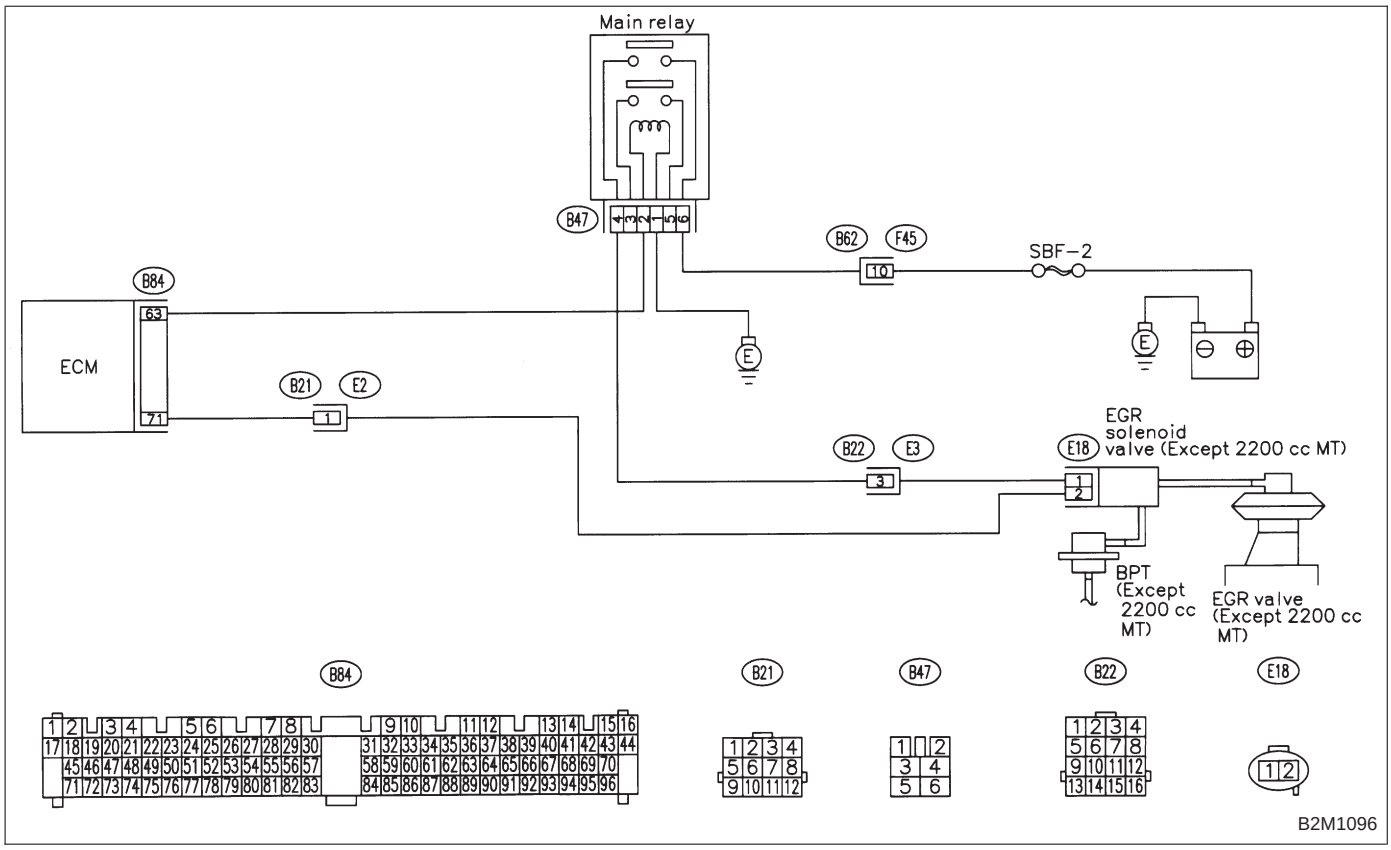
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Poor driving performance on low engine speed

WIRING DIAGRAM:



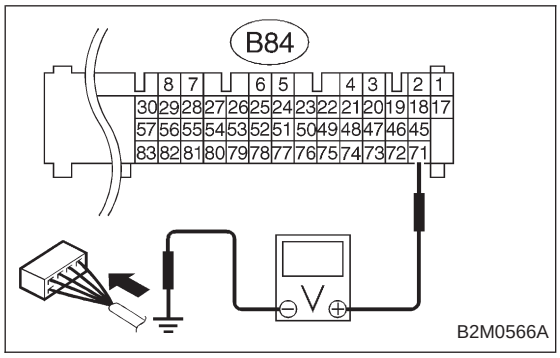
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10CN1	CHECK ENGINE/TRANSMISSION TYPE.

CHECK ***: Is engine/transmission type 2200 cc/MT?***

YES : Check AT/MT identification circuit. <Ref. to 2-7 [T10DD0].>

NO : Go to step **10CN2**.



10CN2	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 71 (+) — Chassis ground (−): Is the voltage more than 10 V?***

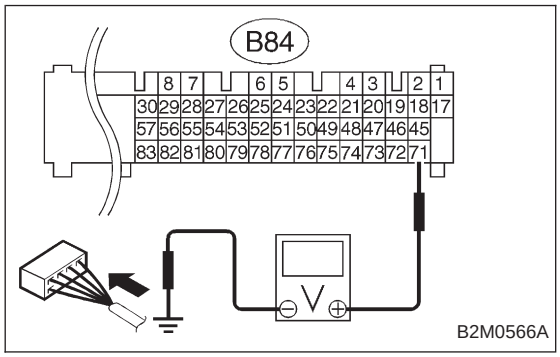
YES : Go to step **10CN3**.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



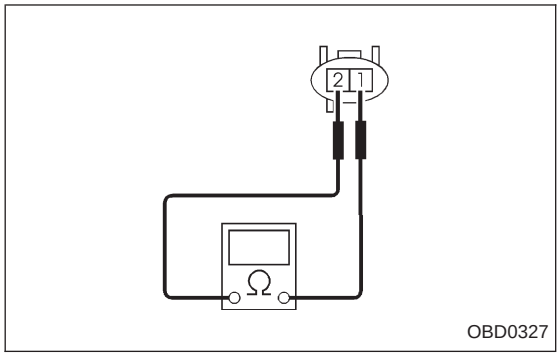
10CN3	CHECK HARNESS BETWEEN EGR SOLENOID VALVE AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from EGR solenoid valve.
3) Turn ignition switch to ON.
4) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 71 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and EGR solenoid valve connector. After repair, replace ECM.

NO : Go to next step 5).



5) Turn ignition switch to OFF.
6) Measure resistance between EGR solenoid valve terminals.

CHECK ***: Terminals***
No. 1 — No. 2:
Is the resistance less than 1 Ω?

YES : Replace EGR solenoid valve and ECM.
NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***
YES : Repair poor contact in ECM connector.
NO : Replace ECM.

OBD (FB1)

P1422 <CPC_HI>

B2M1133

CO: DTC P1422 — EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH INPUT —

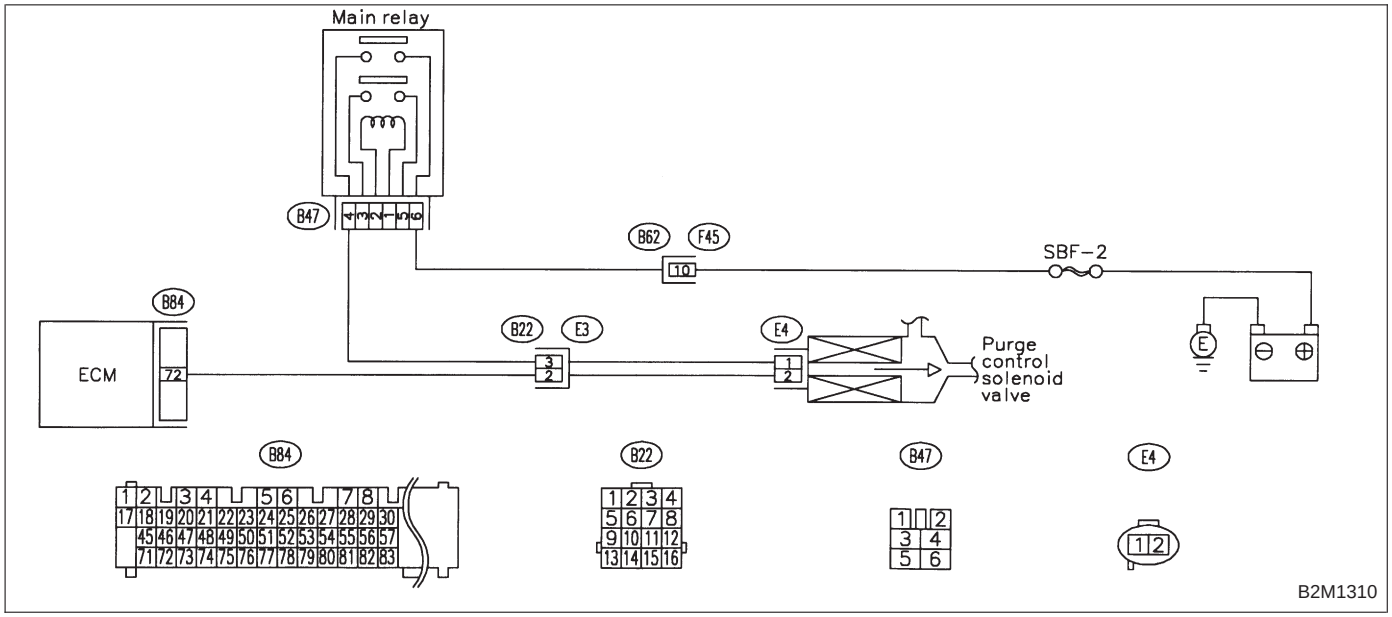
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

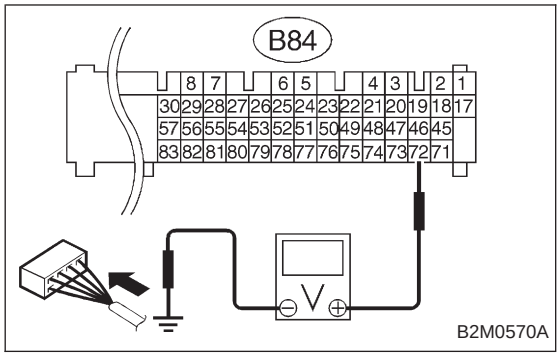
TROUBLE SYMPTOM:

- Erroneous idling

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10CO1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 72 (+) — Chassis ground (−): Is the voltage more than 10 V?***

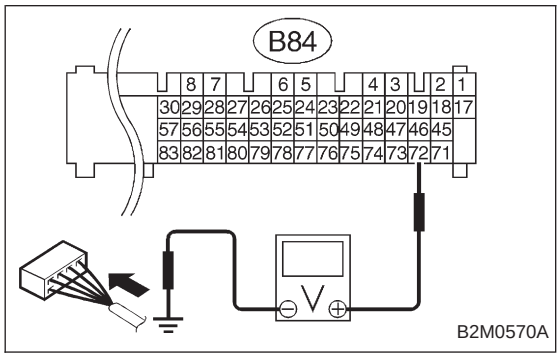
YES : Go to step **10CO2**.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



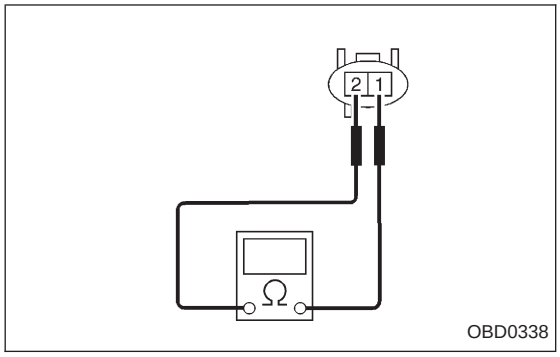
10CO2	CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from purge control solenoid valve.
3) Turn ignition switch to ON.
4) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 72 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and purge control solenoid valve connector. After repair, replace ECM.

NO : Go to next step 5).



5) Turn ignition switch to OFF.
6) Measure resistance between purge control solenoid valve terminals.

CHECK ***: Terminals No. 1 — No. 2: Is the resistance less than 1 Ω?***

YES : Replace purge control solenoid valve and ECM.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.

OBD (FB1)

P1423<VCMSOL_HI>

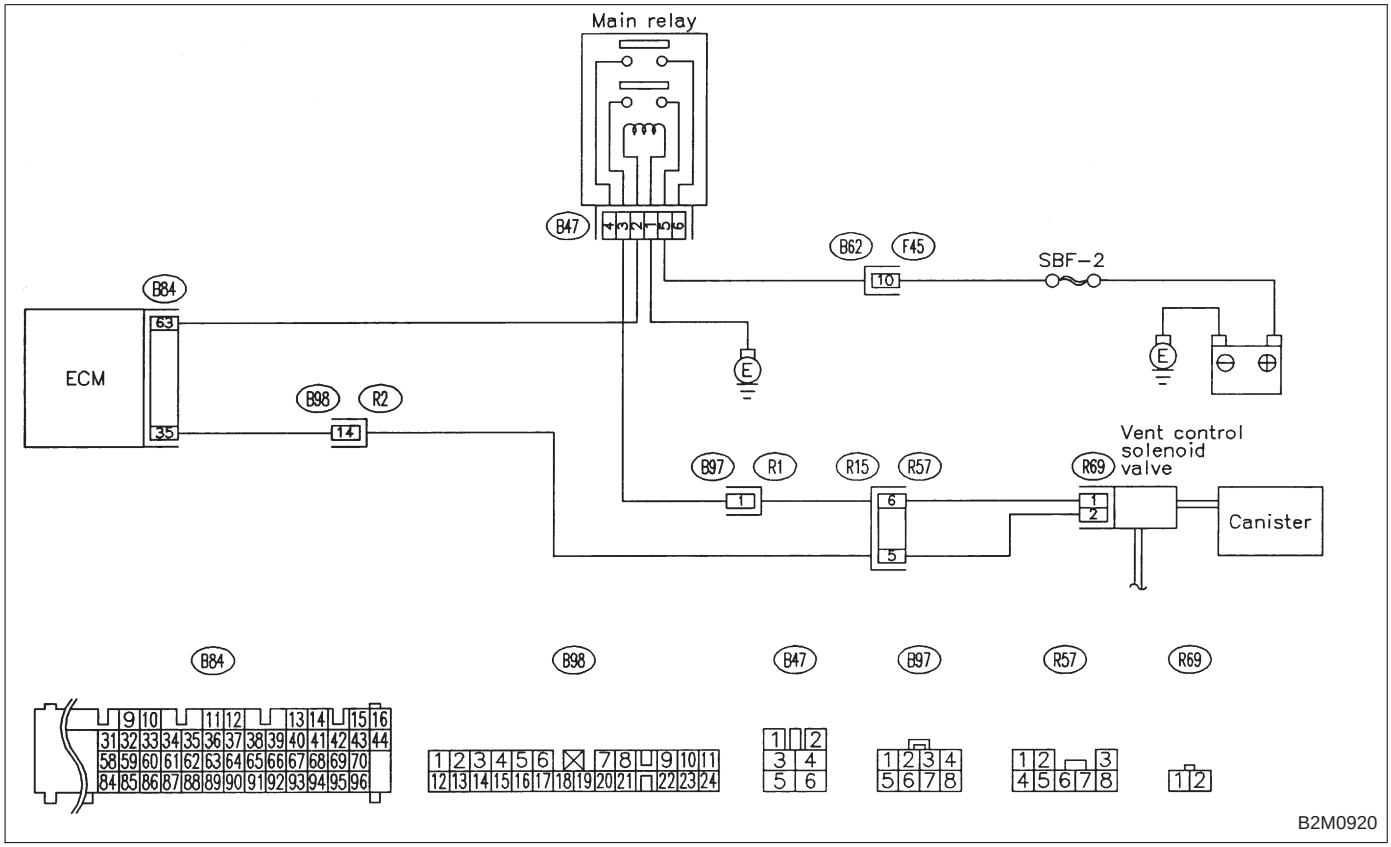
B2M1134

CP: DTC P1423 — EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL HIGH INPUT —

DTC DETECTING CONDITION:

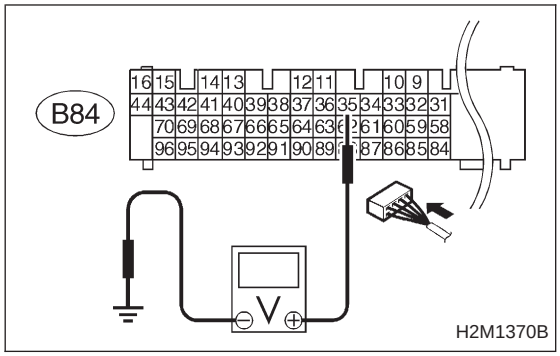
- Two consecutive driving cycles with fault

WIRING DIAGRAM:



B2M0920

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10CP1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 35 (+) — Chassis ground (−): Is the voltage more than 10 V?***

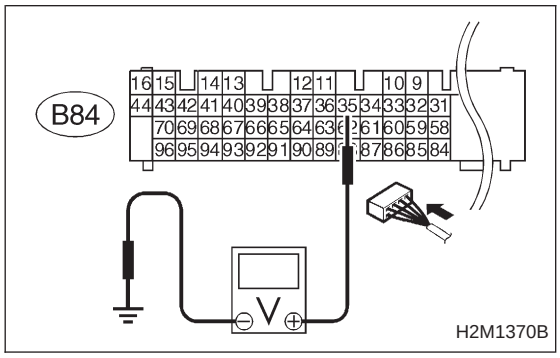
YES : Go to step **10CP2**.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



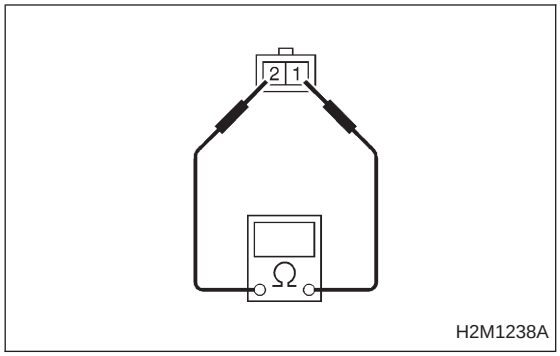
10CP2	CHECK HARNESS BETWEEN VENT CONTROL SOLENOID VALVE AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from vent control solenoid valve.
3) Turn ignition switch to ON.
4) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 35 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and vent control solenoid valve connector. After repair, replace ECM.

NO : Go to next step 5).



5) Turn ignition switch to OFF.
6) Measure resistance between vent control solenoid valve terminals.

CHECK ***: Terminals No. 1 — No. 2: Is the resistance less than 1 Ω?***

YES : Replace vent control solenoid valve and ECM.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.

OBD (FB1)

P1440 <PCV_FLOW>

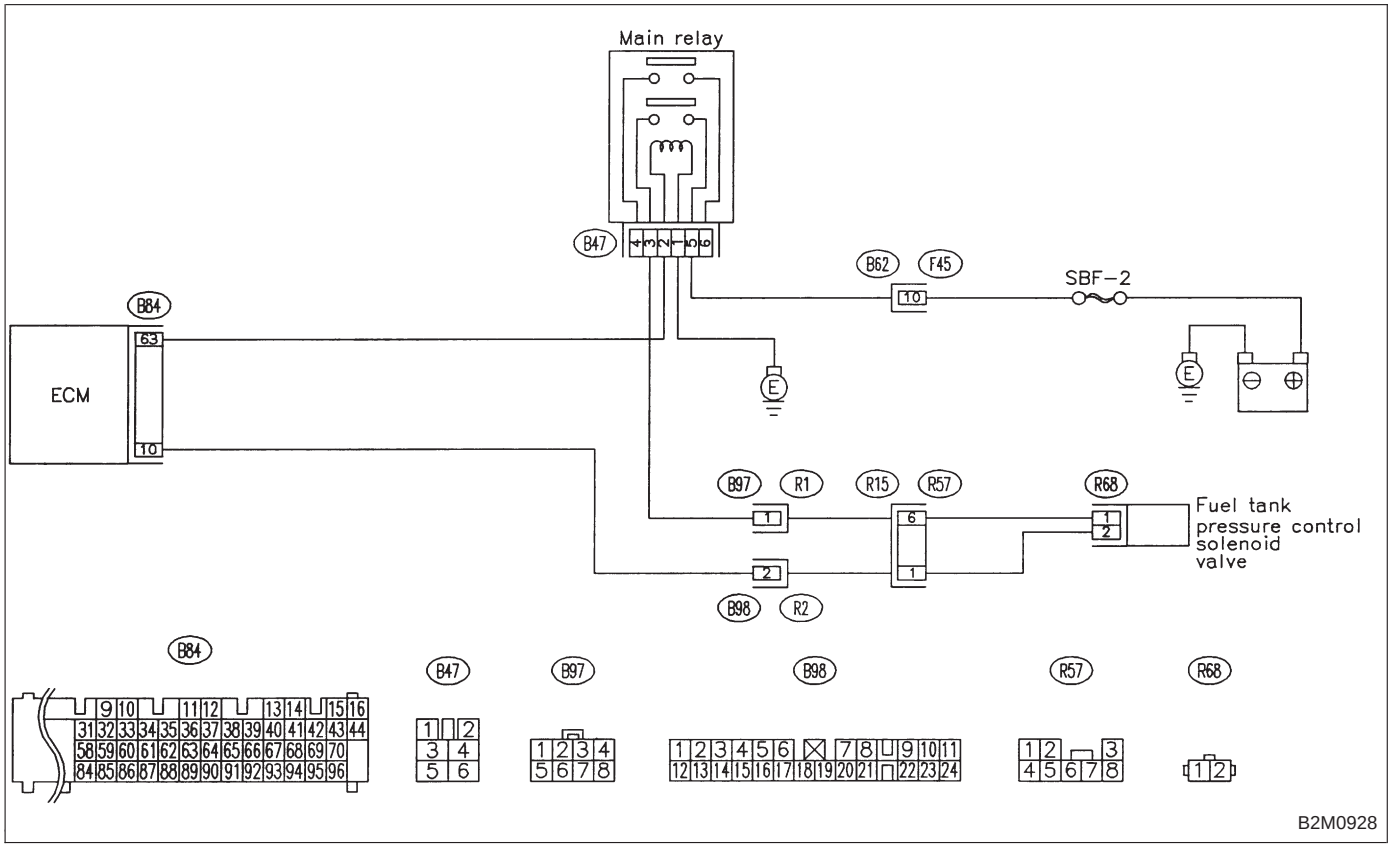
B2M1135

CQ: DTC P1440 — FUEL TANK PRESSURE CONTROL SYSTEM FUNCTION PROBLEM (LOW INPUT) —

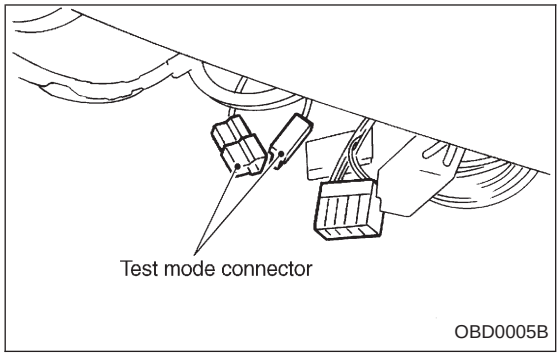
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10CQ1	CHECK FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Connect test mode connector.
3) Turn ignition switch to ON.

CHECK ***: Does fuel tank pressure control solenoid valve produce operating sound?***

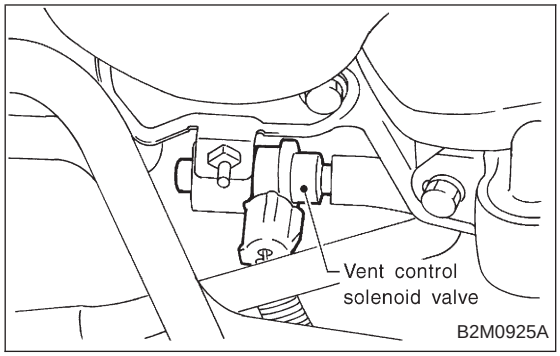
NOTE:
Fuel tank pressure control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD07). For the procedure, refer to “COMPULSORY VALVE OPERATION CHECK MODE”. <Ref. to 2-7 [T3F0].>

YES : Go to step **10CQ2**.
NO : Replace fuel tank pressure control solenoid valve.

10CQ2	CHECK FUEL FILLER CAP AND FUEL FILLER PIPE.

1) Turn ignition switch to OFF.
2) Open the fuel flap.

CHECK ***: Is the fuel filler cap tightened securely?***
YES : Tighten fuel filler cap securely.
NO : Go to next CHECK .
CHECK ***: Is there any damage to the seal between fuel filler cap and fuel filler pipe?***
YES : Repair or replace fuel filler cap and fuel filler pipe.
NO : Go to step **10CQ3**.



10CQ3	CHECK VENT CONTROL SOLENOID VALVE.

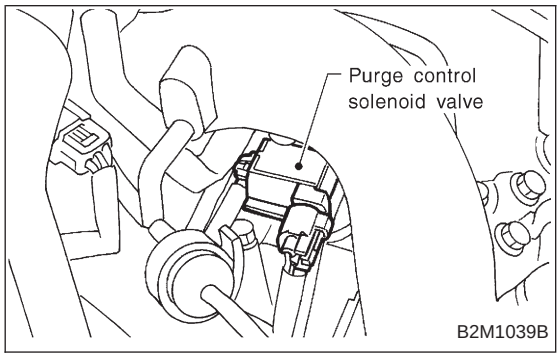
Turn ignition switch to ON.

CHECK ***: Does vent control solenoid valve produce operating sound?***

NOTE:
Vent control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD08). For the procedure, refer to “COMPULSORY VALVE OPERATION CHECK MODE”. <Ref. to 2-7 [T3F0].>

YES : Go to step **10CQ4**.

NO : Replace vent control solenoid valve.



10CQ4	CHECK PURGE CONTROL SOLENOID VALVE.

CHECK ***: Does purge control solenoid valve produce operating sound?***

NOTE:
Purge control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD02). For the procedure, refer to “COMPULSORY VALVE OPERATION CHECK MODE”. <Ref. to 2-7 [T3F0].>

YES : Go to step **10CQ5**.

NO : Replace purge control solenoid valve.

10CQ5	CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.

Turn ignition switch to OFF.

CHECK ***: Does fuel leak in fuel line?***

YES : Repair or replace fuel line.

NO : Go to next CHECK .

CHECK ***: Is there any damage at canister?***

YES : Repair or replace canister.

NO : Go to next CHECK .

CHECK ***: Is there any damage at fuel tank?***

YES : Repair or replace fuel tank.

NO : Go to next CHECK .

CHECK ***: Are there holes, cracks or disconnections of hoses or pipes in evaporative emission control system?***

YES : Repair or replace hoses or pipes.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

OBD (FB1)

P1441 <PCV_FHI>

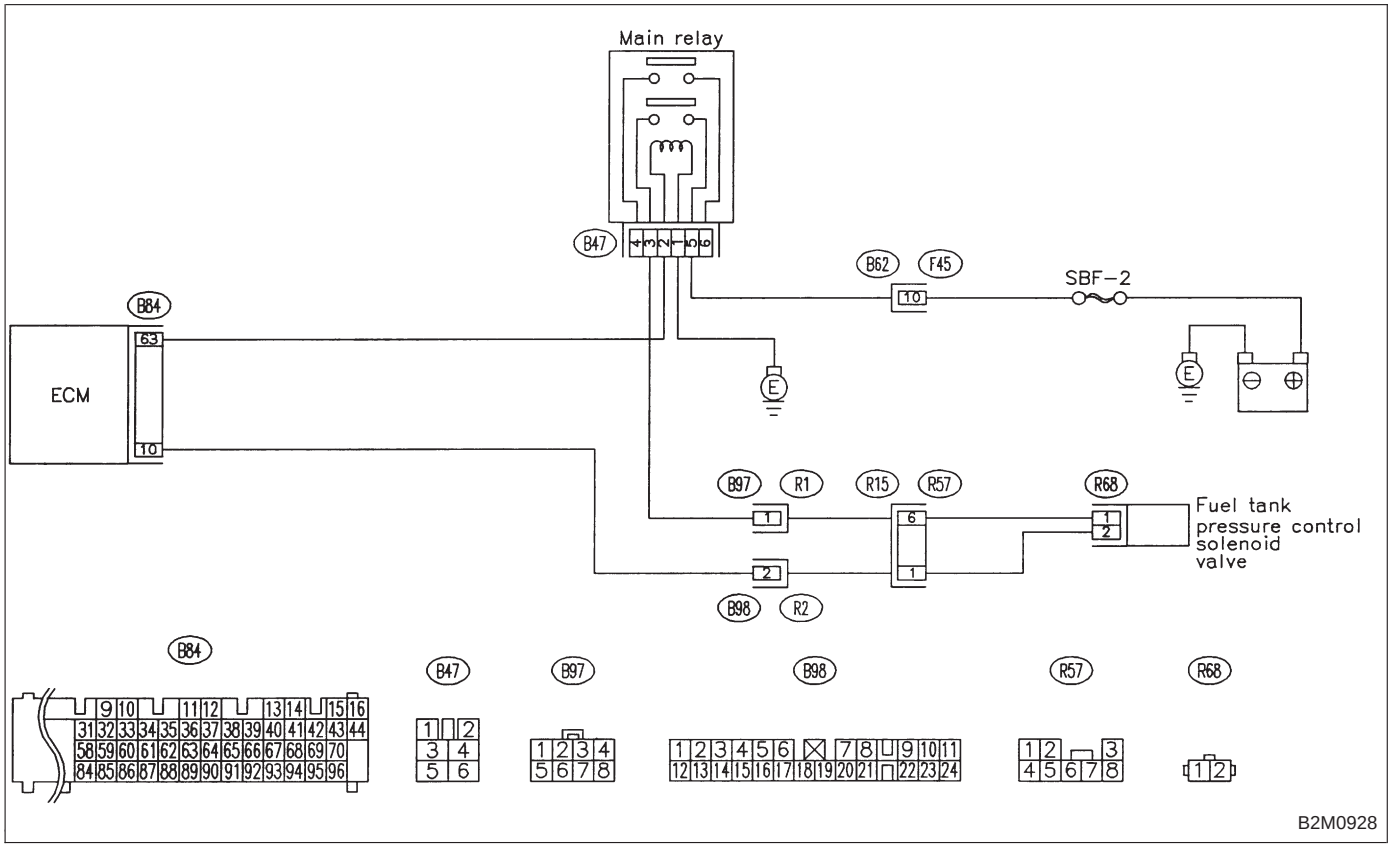
B2M1136

CR: DTC P1441 — FUEL TANK PRESSURE CONTROL SYSTEM FUNCTION PROBLEM (HIGH INPUT) —

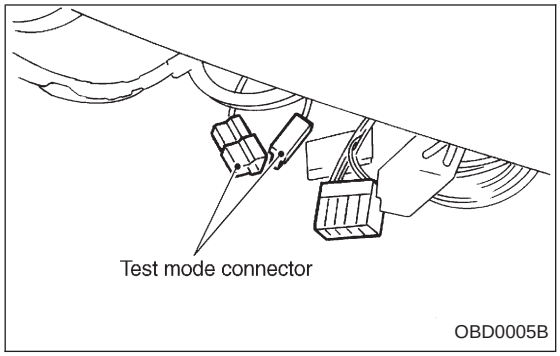
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10CR1	CHECK FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Connect test mode connector.
3) Turn ignition switch to ON.

CHECK ***: Does fuel tank pressure control solenoid valve produce operating sound?***

NOTE:
Fuel tank pressure control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD07). For the procedure, refer to “COMPULSORY VALVE OPERATION CHECK MODE”. <Ref. to 2-7 [T3F0].>

YES : Go to step **10CR2**.

NO : Replace fuel tank pressure control solenoid valve.

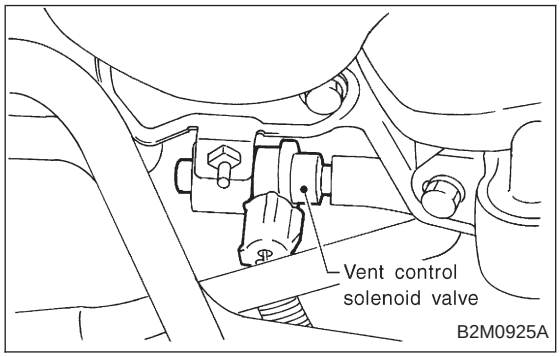
10CR2	CHECK FUEL FILLER CAP AND FUEL FILLER PIPE.

1) Turn ignition switch to OFF.
2) Open the fuel flap.

CHECK ***: Is there any damage at fuel filler cap and fuel filler pipe?***

YES : Repair or replace fuel filler cap and fuel filler pipe.

NO : Go to step **10CR3**.



10CR3	CHECK VENT CONTROL SOLENOID VALVE.

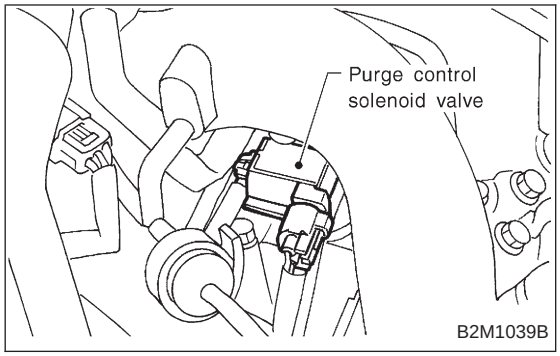
Turn ignition switch to ON.

CHECK ***: Does vent control solenoid valve produce operating sound?***

NOTE:
Vent control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD08). For the procedure, refer to “COMPULSORY VALVE OPERATION CHECK MODE”. <Ref. to 2-7 [T3F0].>

YES : Go to step **10CR4**.

NO : Replace vent control solenoid valve.



10CR4	CHECK PURGE CONTROL SOLENOID VALVE.

CHECK ***: Does purge control solenoid valve produce operating sound?***

NOTE:
Purge control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD02). For the procedure, refer to “COMPULSORY VALVE OPERATION CHECK MODE”. <Ref. to 2-7 [T3F0].>

YES : Go to step **10CR5**.

NO : Replace purge control solenoid valve.

10CR5	CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.

Turn ignition switch to OFF.

CHECK ***: Is there any damage at canister?***

YES : Repair or replace canister.

NO : Go to next CHECK .

CHECK ***: Is there any damage at fuel tank?***

YES : Repair or replace fuel tank.

NO : Go to next CHECK .

CHECK ***: Is there clogging of hoses or pipes in evaporative emission control system?***

YES : Repair or replace hoses or pipes.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

OBD (FB1)

P1442 <FLVL_R2>

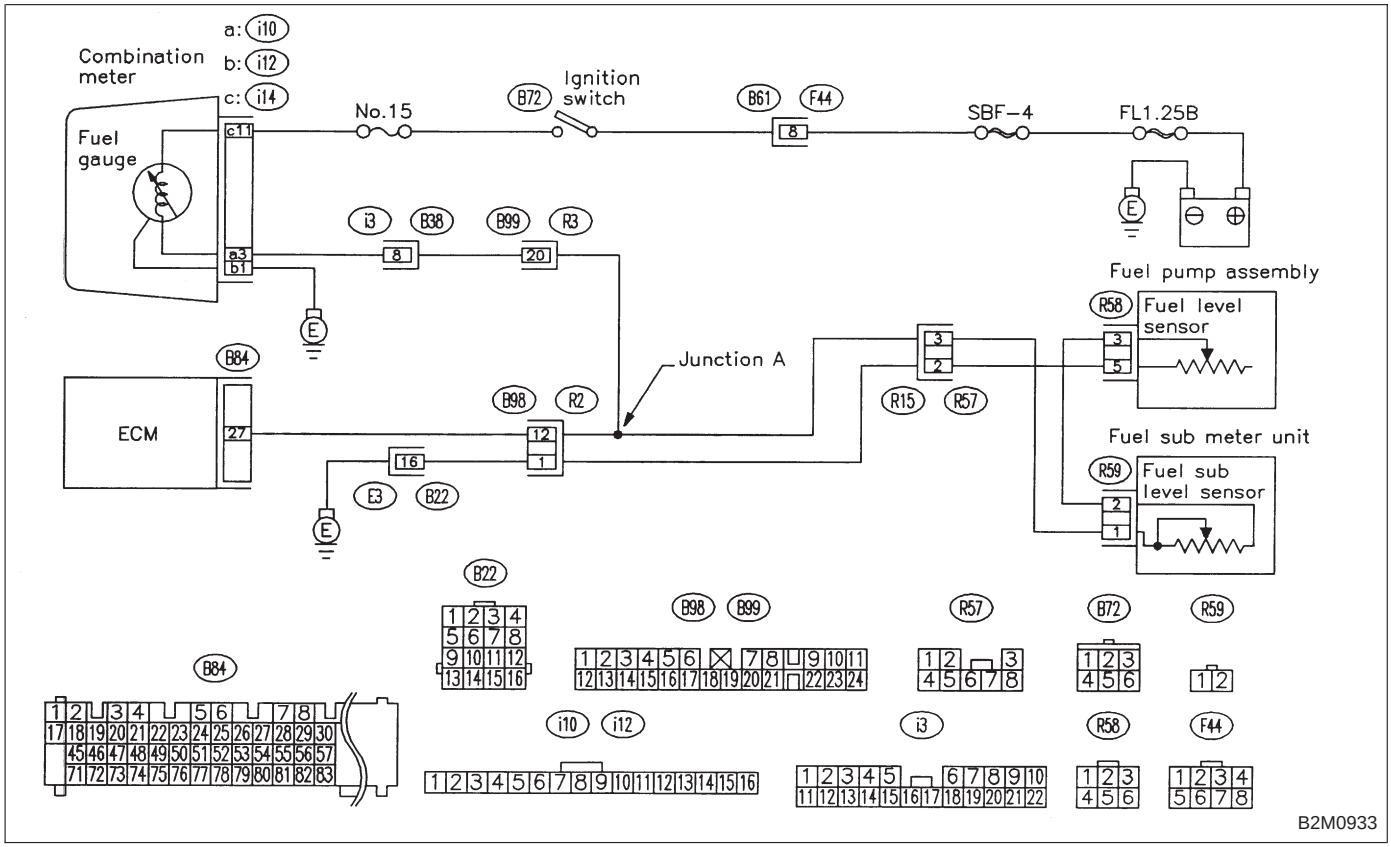
B2M1137

CS: DTC P1442 — FUEL LEVEL SENSOR CIRCUIT RANGE/ PERFORMANCE PROBLEM 2 —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



B2M0933

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10CS1	**CHECK DTC P0461, P0462 OR P0463 ON DISPLAY.**

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0461, P0462 or P0463?***

YES : Inspect DTC P0461, P0462 or P0463 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect this trouble.

NO : Replace fuel sending unit and fuel sub meter unit.

OBD (FB1)

P1500 <FAN_1>

OBD0527

CT: DTC P1500 — RADIATOR FAN RELAY 1 CIRCUIT LOW INPUT —

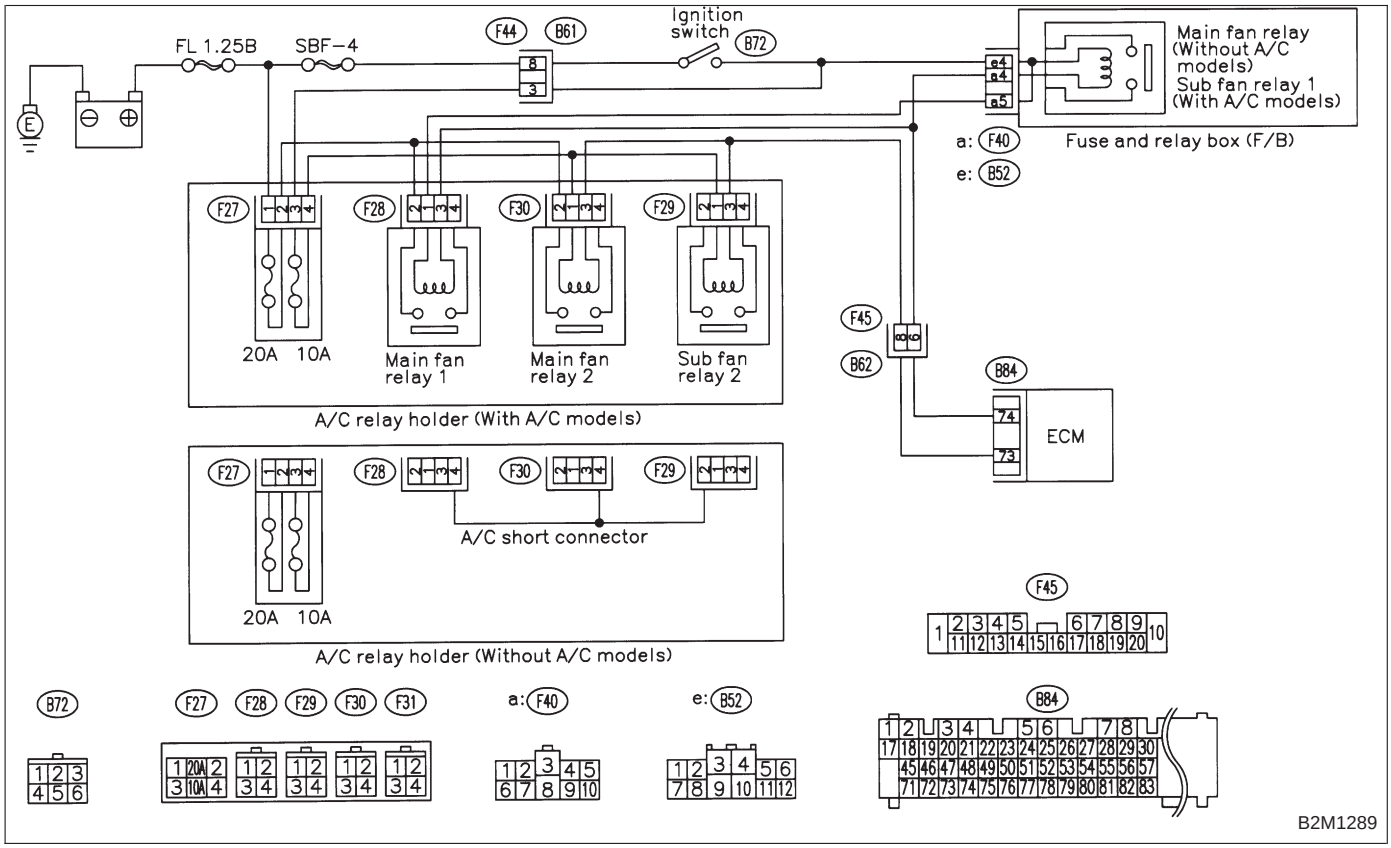
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

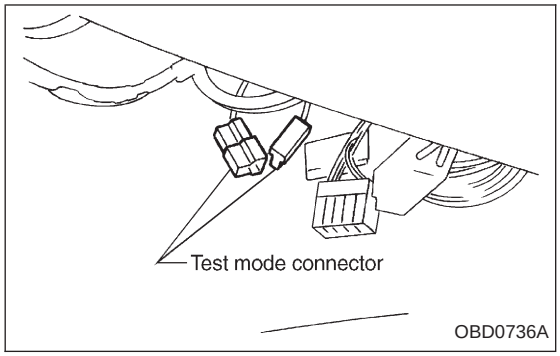
TROUBLE SYMPTOM:

- Radiator fan does not operate properly.
- Overheating

WIRING DIAGRAM:

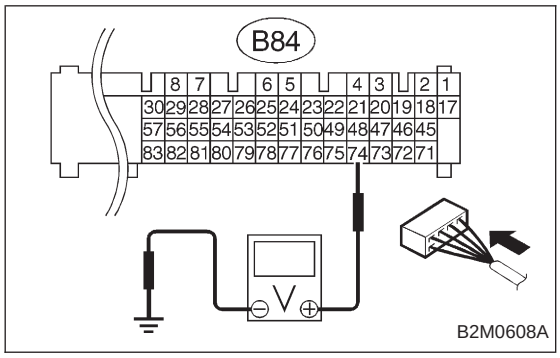


CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODE.
<Ref. to 2-7 [T3D0] and [T3E0].>



10CT1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to OFF.
2) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.
3) Turn ignition switch to ON.



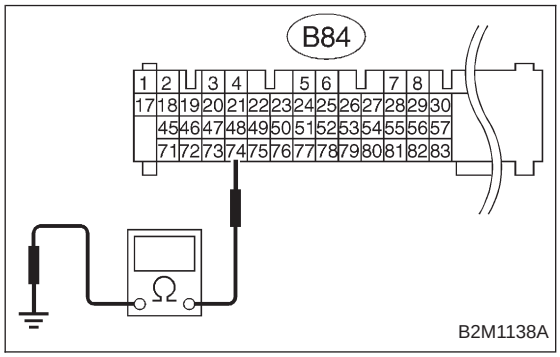
4) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal***
(B84) No. 74 (+) — Chassis ground:
Does voltage change between 0 and 10 volts?

NOTE:
Radiator fan relay operation check can be executed using Subaru Select Monitor (Function mode: FD03). For procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Repair poor contact in ECM connector.

NO : Go to step **10CT2**.



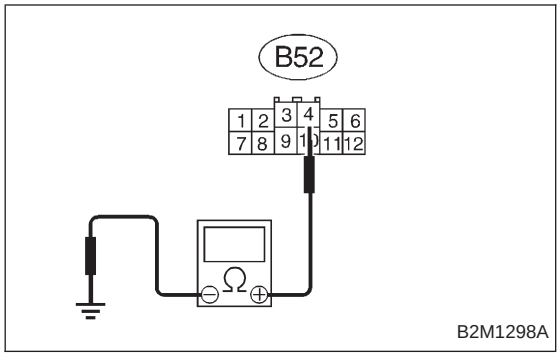
10CT2	CHECK GROUND SHORT CIRCUIT IN RADIATOR FAN RELAY 1 CONTROL CIRCUIT.

1) Turn ignition switch to OFF.
2) Disconnect connectors from ECM.
3) Measure resistance of harness between ECM connector and chassis ground.

CHECK ***: Connector & terminal***
(B84) No. 74 — Chassis ground:
Is the resistance less than 10 Ω?

YES : Repair ground short circuit in radiator fan relay 1 control circuit.

NO : Go to step **10CT3**.



10CT3	CHECK POWER SUPPLY FOR RELAY.

1) Disconnect connector (B52) from fuse and relay box (F/B).
2) Turn ignition switch to ON.
3) Measure voltage between fuse and relay box (F/B) connector and chassis ground.

CHECK : ***Connector & terminal (B52) No. 4 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Go to step **10CT4**.

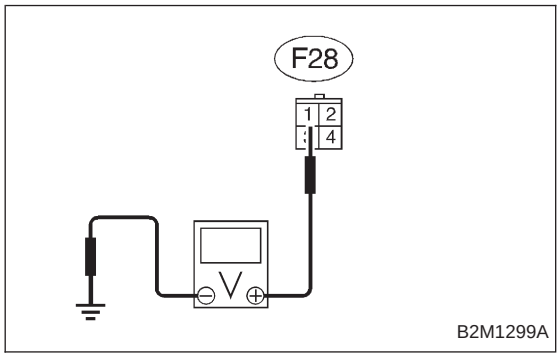
NO : Repair open circuit in harness between ignition switch and fuse and relay box (F/B) connector.

10CT4	CHECK VEHICLE MODEL.

CHECK : ***Is the vehicle equipped with A/C?***

YES : Go to step **10CT5**.

NO : Go to step **10CT6**.



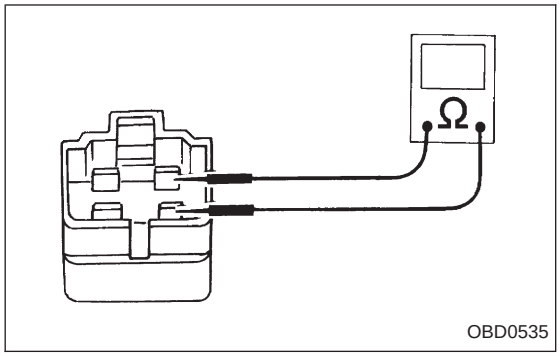
10CT5	CHECK POWER SUPPLY FOR MAIN FAN RELAY 1.

1) Turn ignition switch to OFF.
2) Connect connector (B52) to fuse and relay box (F/B).
3) Remove main fan relay 1.
4) Turn ignition switch to ON.
5) Measure voltage between main fan relay 1 connector and chassis ground.

CHECK : ***Connector & terminal (F28) No. 1 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Go to step **10CT6**.

NO : Repair open circuit in harness between fuse and relay box (F/B) and main fan relay 1 connector.

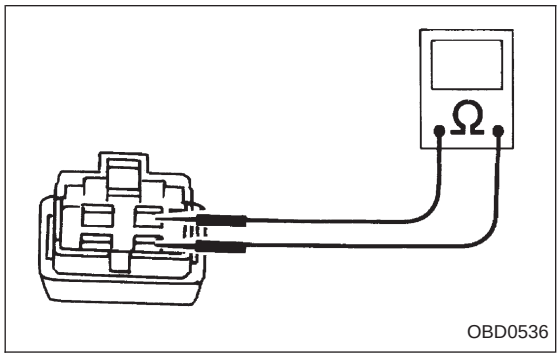


10CT6	CHECK MAIN FAN RELAY 1, SUB FAN RELAY 1 AND MAIN FAN RELAY.

1) Turn ignition switch to OFF.
2) Measure resistance between main fan relay 1 terminals. (With A/C models only)

CHECK ***: Terminal***
No. 1 — No. 3:
Is the resistance between 87 and 107 Ω?

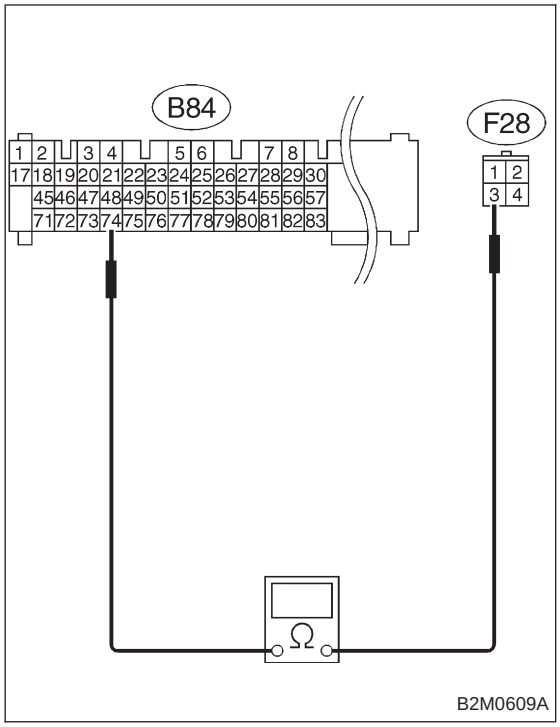
YES : Go to next step 3).
NO : Replace main fan relay 1.



3) Remove sub fan relay 1. (With A/C models only)
Remove main fan relay. (Without A/C models only)
4) Measure resistance between sub fan relay 1 or main fan relay terminals.

CHECK ***: Terminal***
No. 1 — No. 3:
Is the resistance between 83 and 117 Ω?

YES : Go to step **10CT7**.
NO : Replace sub fan relay 1.



10CT7	CHECK OPEN CIRCUIT IN RADIATOR FAN RELAY 1 CONTROL CIRCUIT.

1) Disconnect connector (F40) from fuse and relay box (F/B).
2) Measure resistance of harness between ECM and main fan relay 1 connector.

NOTE:
With A/C models only.

CHECK ***: Connector & terminal (B84) No. 74 — (F28) No. 3: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair harness and connector.

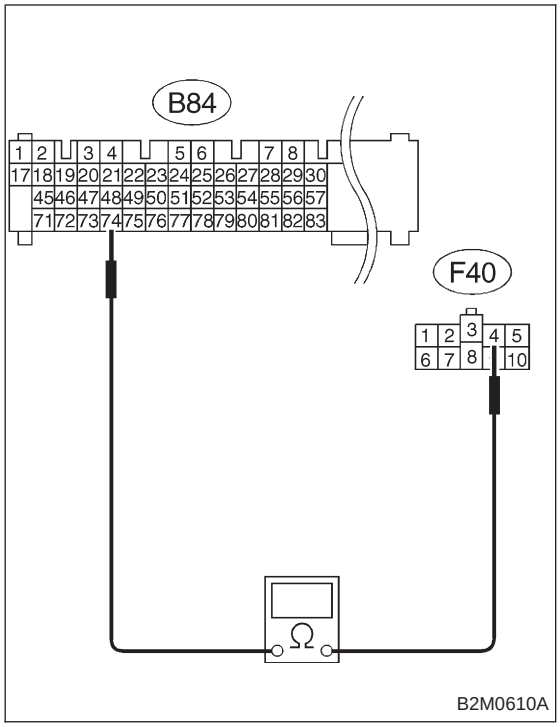
NOTE:
In this case, repair the following:

- Open circuit in harness between ECM and main fan relay 1 connector
- Poor contact in coupling connector (F45)

CHECK ***: Is there poor contact in ECM or main fan relay 1 connector?***

YES : Repair poor contact in ECM or main fan relay 1 connector.

NO : Go to next step 3).



3) Measure resistance of harness between ECM and sub fan relay 1 (with A/C models) or main fan relay (without A/C models) connector.

CHECK ***: Connector & terminal (B84) No. 74 — (F40) No. 4: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:

- Open circuit in harness between ECM and sub fan relay 1 (with A/C models) or main fan relay (without A/C models) connector
- Poor contact in coupling connector (F45)
- Replace diode (A/C)

CHECK ***: Is there poor contact in ECM or sub fan relay 1 (with A/C models) or main fan relay (without A/C models) connector?***

YES : Repair poor contact in ECM or sub fan relay 1 (with A/C models) or main fan relay (without A/C models) connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

OBD (FB1)

P1502 <FAN_F>

OBD0538

CU: DTC P1502
— RADIATOR FAN FUNCTION PROBLEM —

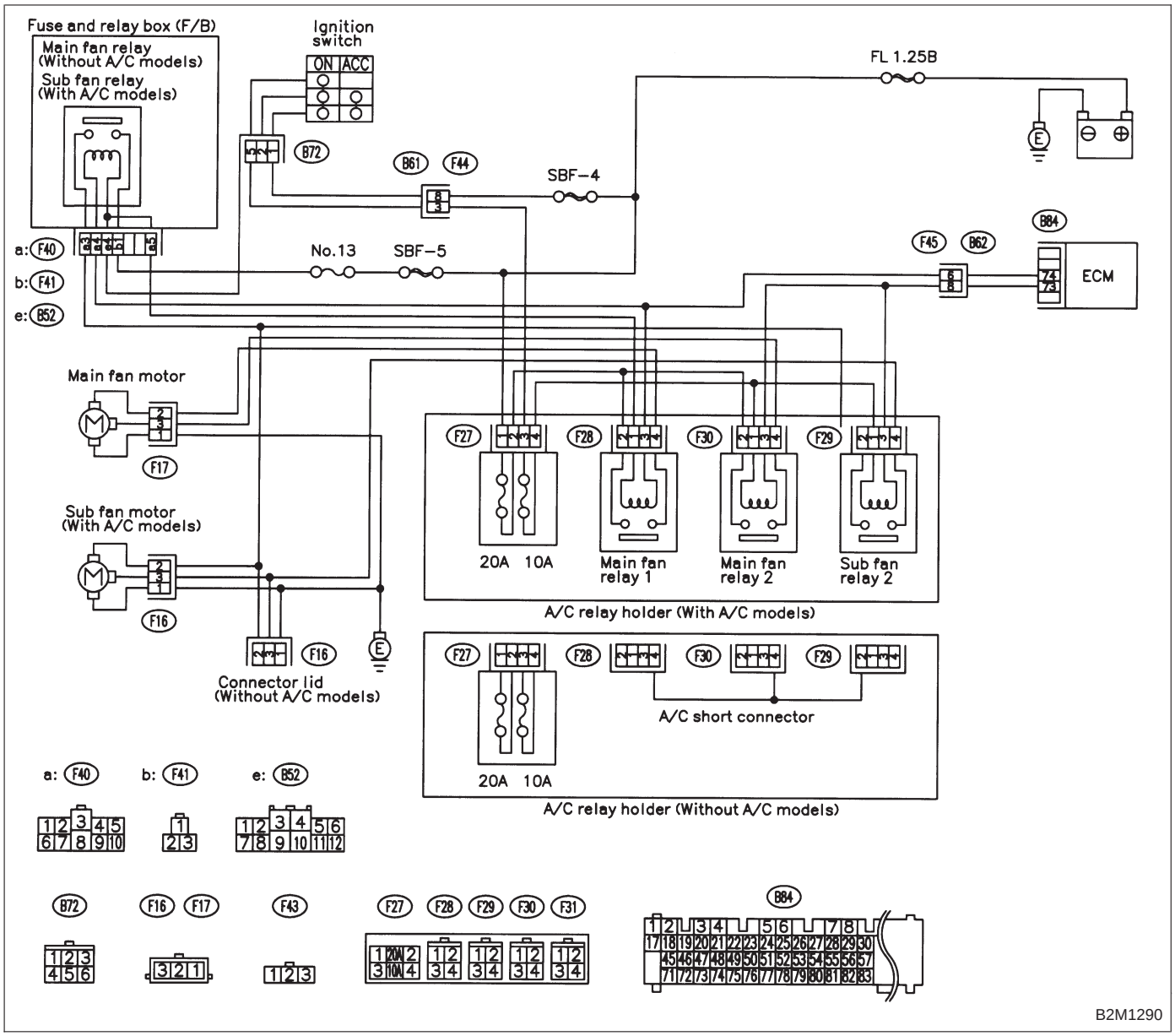
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Occurrence of noise
- Overheating

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

NOTE:
If the vehicle, with the engine idling, is placed very close to a wall or another vehicle, preventing normal cooling function, the OBD system may detect malfunction.

10CU1	**CHECK ANY OTHER DTC (BESIDE DTC P1502) ON DISPLAY.**

CHECK ***: Is there any other DTC on display?***

YES : Inspect the relevant DTC using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NO : Check engine cooling system. <Ref. to 2-5 [K100].>

OBD (FB1)
P1507 <ISC_SHI>
B2M1140

CV: DTC P1507 — IDLE CONTROL SYSTEM MALFUNCTION (FAIL-SAFE) —

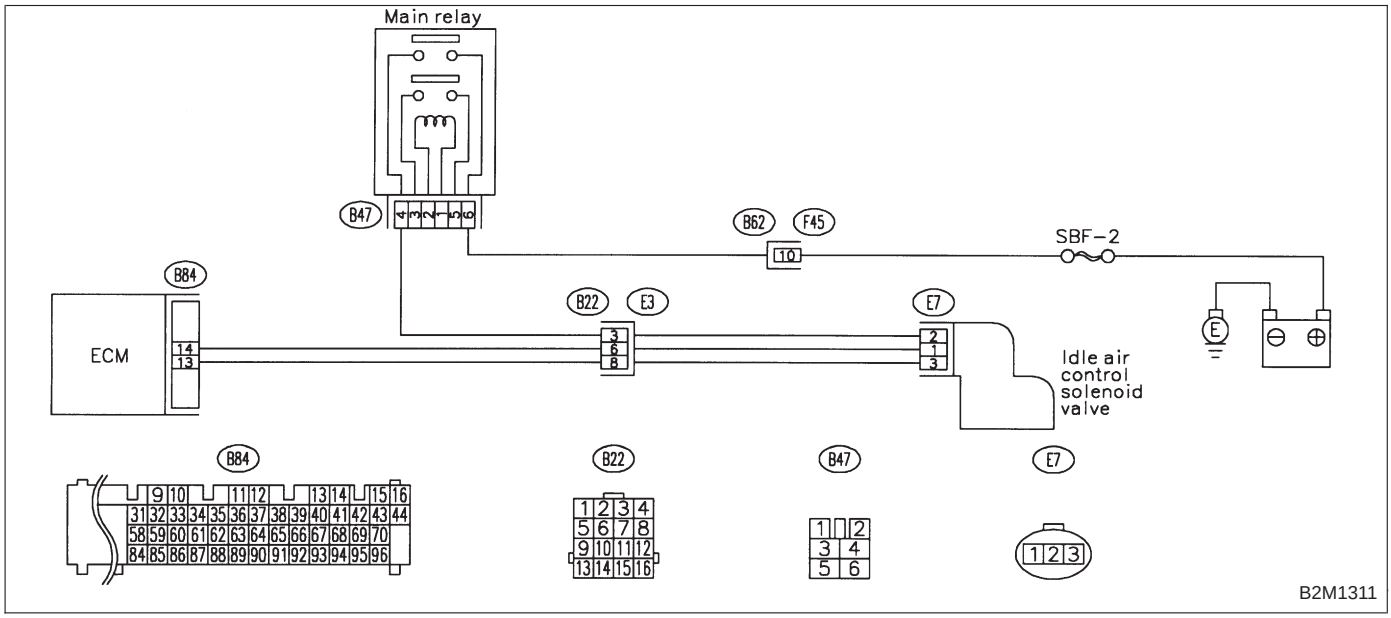
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Engine keeps running at higher revolution than specified idling revolution.

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10CV1	CHECK DTC P0505 ON DISPLAY.

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0505?***

YES : Inspect DTC P0505 using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NOTE:
In this case, it is not necessary to inspect DTC P1507.

NO : Go to step **10CV2**.

10CV2	CHECK AIR INTAKE SYSTEM.

1) Turn ignition switch to ON.
2) Start engine, and idle it.

CHECK ***: Is there a fault in air intake system?***

NOTE:
Check the following items.

- Loose installation of intake manifold, idle air control solenoid valve and throttle body
- Cracks of intake manifold gasket, idle air control solenoid valve gasket and throttle body gasket
- Loose connections and cracks of idle air control solenoid valve by-pass hoses
- Disconnections of vacuum hoses

YES : Repair air suction and leaks.

NO : Replace idle air control solenoid valve.

OBD (FB1)

P1520 <FAN_1HI>

B2M1141

CW: DTC P1520 — RADIATOR FAN RELAY 1 CIRCUIT HIGH INPUT —

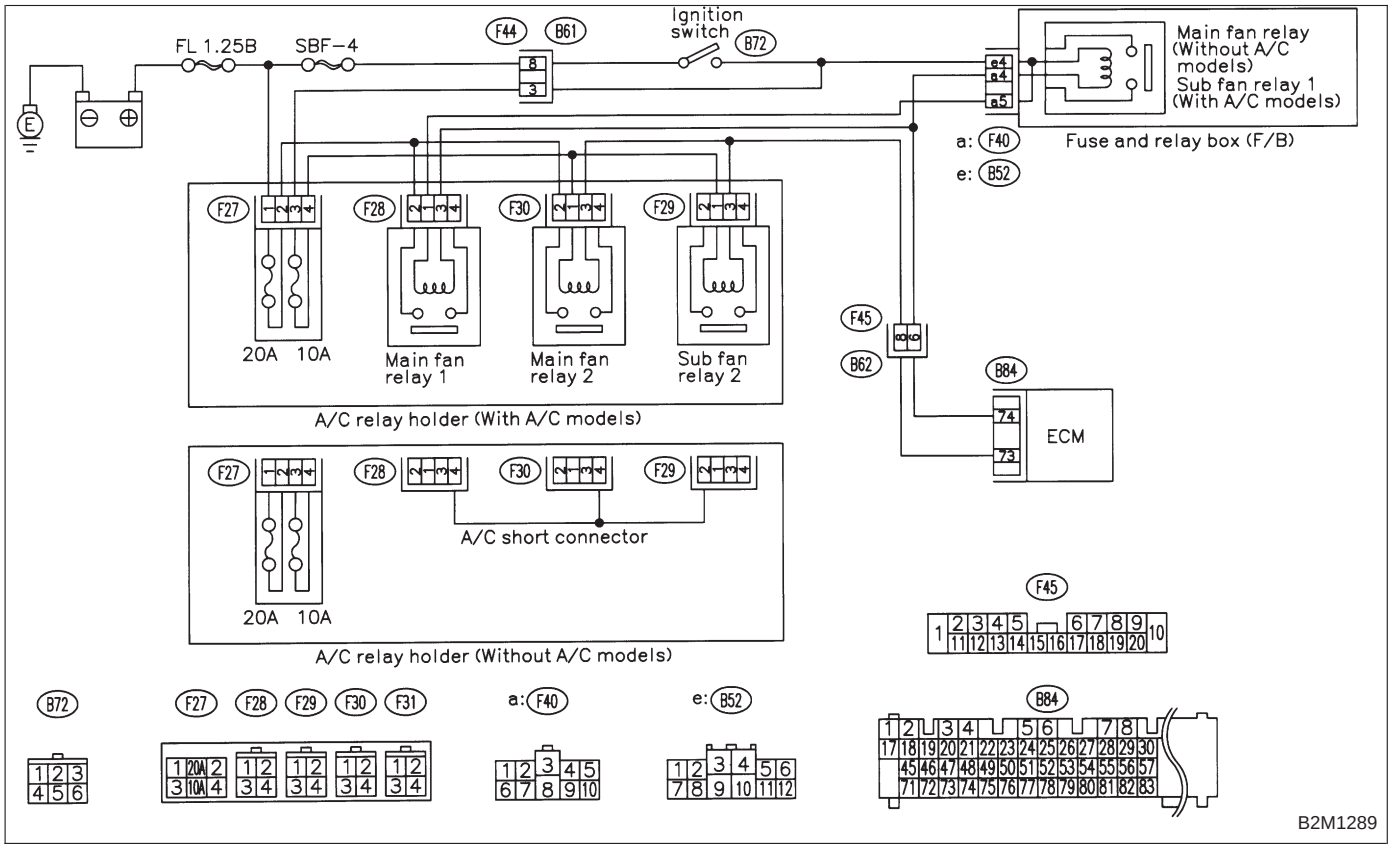
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

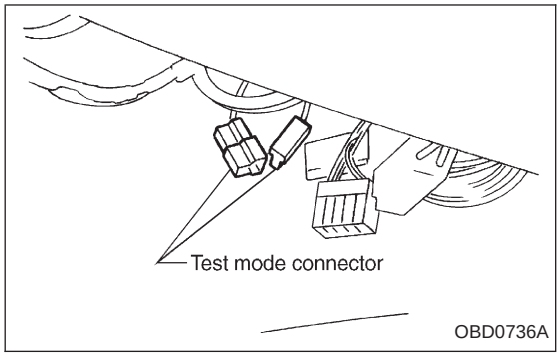
TROUBLE SYMPTOM:

- Radiator fan does not operate properly.
- Overheating

WIRING DIAGRAM:

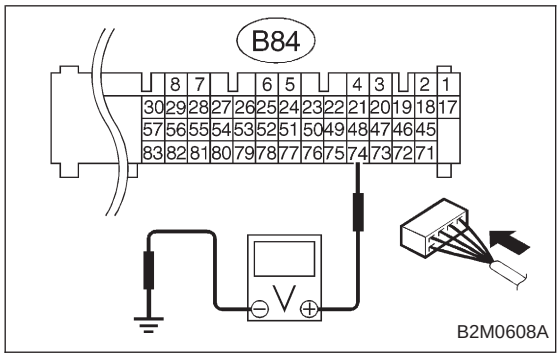


CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODE.
<Ref. to 2-7 [T3D0] and [T3E0].>



10CW1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to OFF.
2) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.
3) Turn ignition switch to ON.



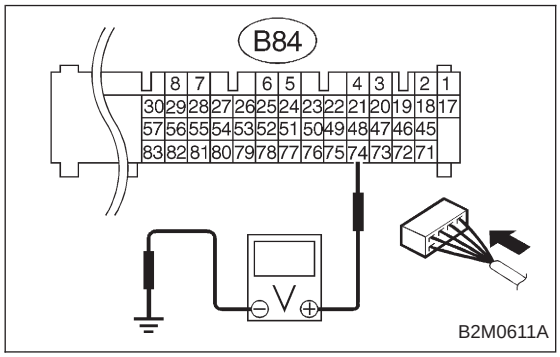
4) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal***
(B84) No. 74 (+) — Chassis ground:
Does voltage change between 0 and 10 volts?

NOTE:
Radiator fan relay operation check can be executed using Subaru Select Monitor (Function mode: FD03). For procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Go to step **10CW2**.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. In this case, repair poor contact in ECM connector.



10CW2	CHECK SHORT CIRCUIT IN RADIATOR FAN RELAY 1 CONTROL CIRCUIT.

1) Turn ignition switch to OFF.
2) Remove main fan relay 1 and sub fan relay 1. (with A/C models)
Remove main fan relay. (without A/C models)
3) Disconnect test mode connector.
4) Turn ignition switch to ON.
5) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal***
(B84) No. 74 (+) — Chassis ground (−):
Is the voltage more than 10 V?

YES : Repair battery short circuit in radiator fan relay 1 control circuit. After repair, replace ECM.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.

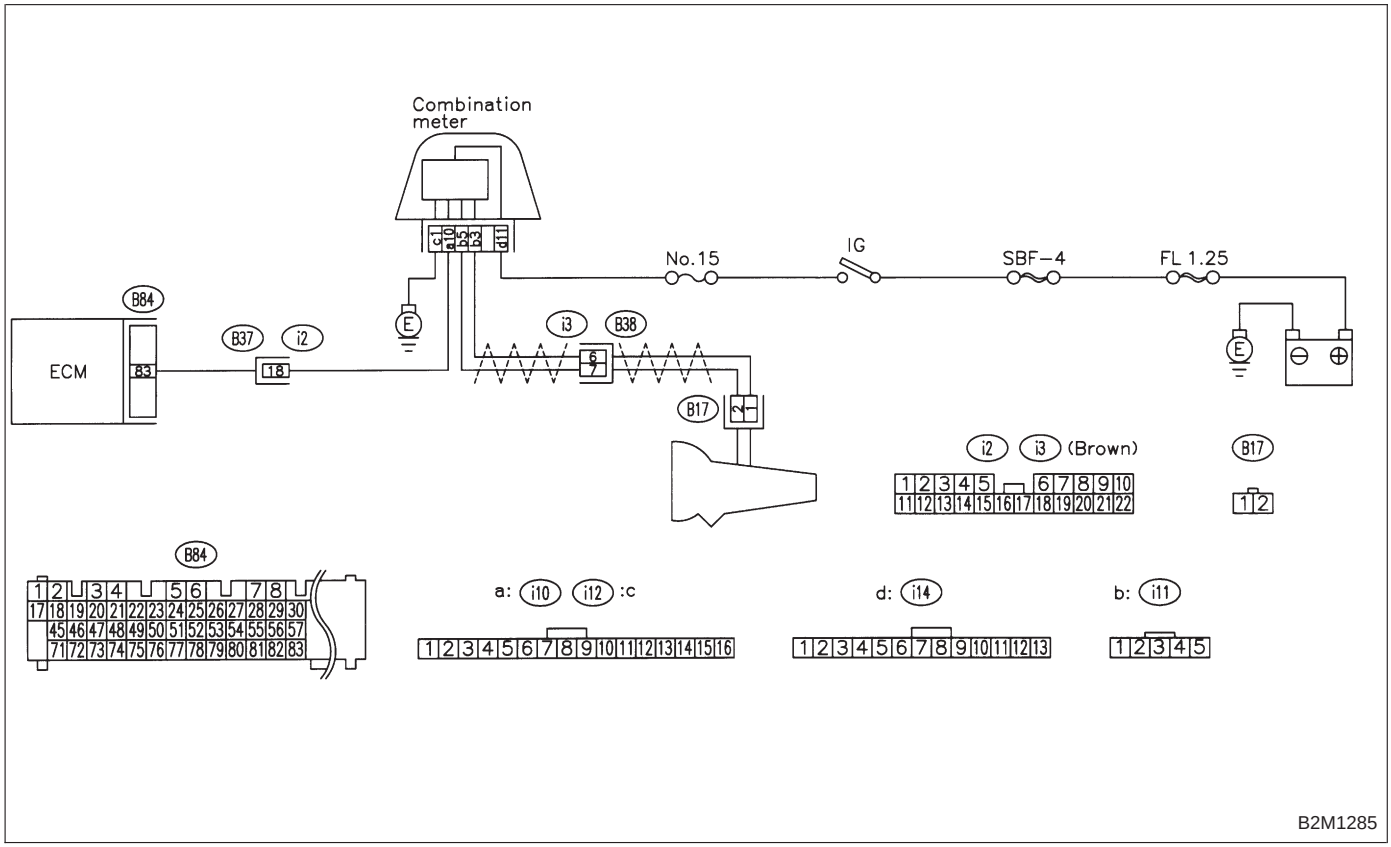
OBD (FB1)
P1540 <VSP_S>
B2M1142

CX: DTC P1540 — VEHICLE SPEED SENSOR MALFUNCTION 2 —

DTC DETECTING CONDITION:

- Immediately at fault recognition

WIRING DIAGRAM:



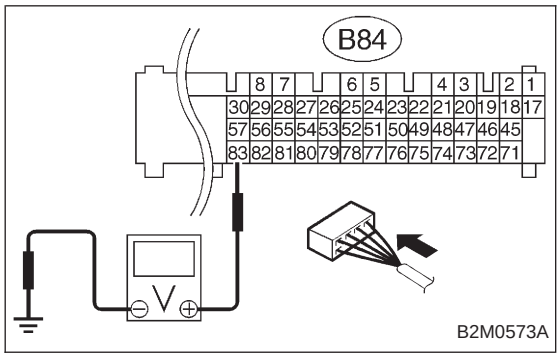
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10CX1	CHECK SPEEDOMETER OPERATION IN COMBINATION METER.

CHECK ***: Does speedometer operate normally?***

YES : Go to step **10CX2**.

NO : Check speedometer and vehicle speed sensor <Ref. to 6-2 [K3A0].>.



10CX2	CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.

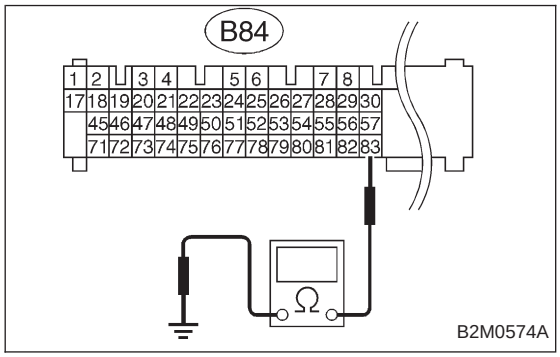
1) Turn ignition switch to OFF.
2) Disconnect connector from TCM.
3) Turn ignition switch to ON.
4) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal***
(B84) No. 83 (+) — Chassis ground (−):
Is the voltage more than 2 V?

YES : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and combination meter connector
- Poor contact in ECM connector
- Poor contact in combination meter connector
- Poor contact in coupling connector (B37)

NO : Go to step **10CX3**.



10CX3	CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from ECM.
3) Measure resistance of harness between ECM connector and chassis ground.

CHECK ***: Connector & terminal***
(B84) No. 83 — Chassis ground:
Is the resistance less than 10 Ω?

YES : Repair ground short circuit in harness between ECM and combination meter connector.

NO : Repair poor contact in ECM connector.

OBD (FB1)

P1700 <ATTH>

OBD0501

CY: DTC P1700 — THROTTLE POSITION SENSOR CIRCUIT MALFUNCTION FOR AUTOMATIC TRANSMISSION —

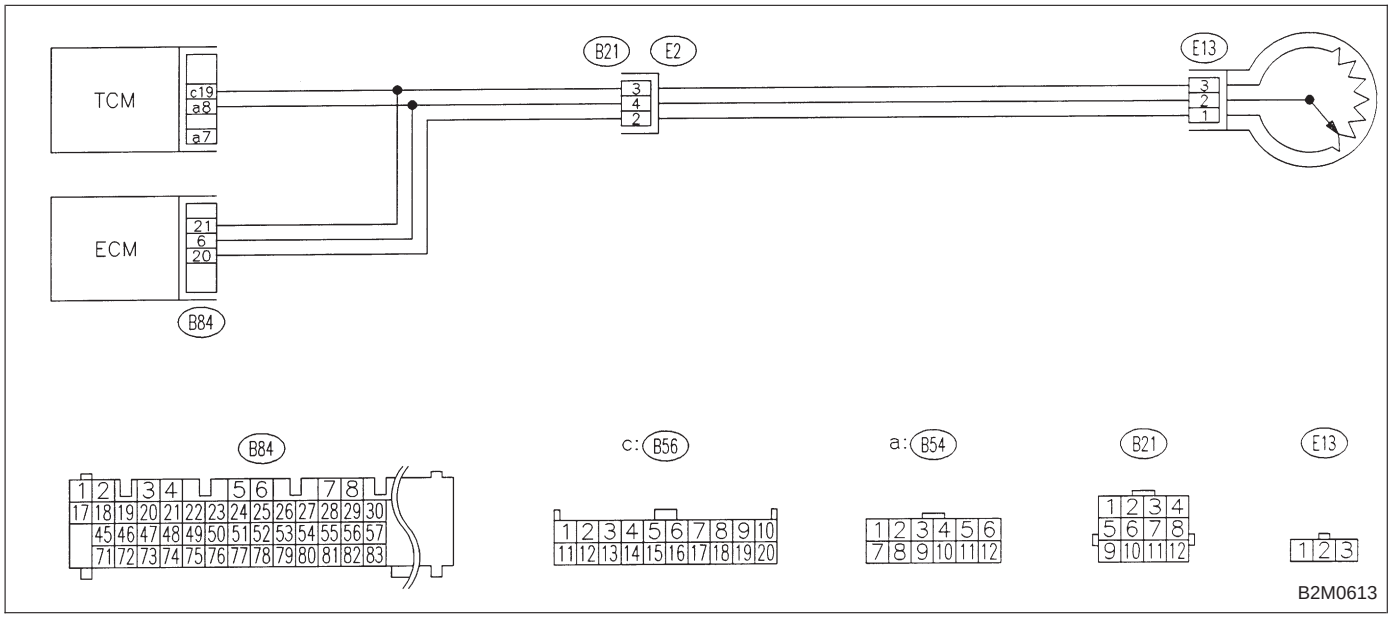
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Shift point too high or too low; engine brake not effected in “3” range; excessive shift shock; excessive tight corner “braking”

WIRING DIAGRAM:



B2M0613

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10CY1	CHECK DTC P1700 ON DISPLAY.

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P1700?***

YES : Check throttle position sensor circuit. <Ref. to 3-2 [T7K0].>

NO : It is not necessary to inspect DTC P1700.

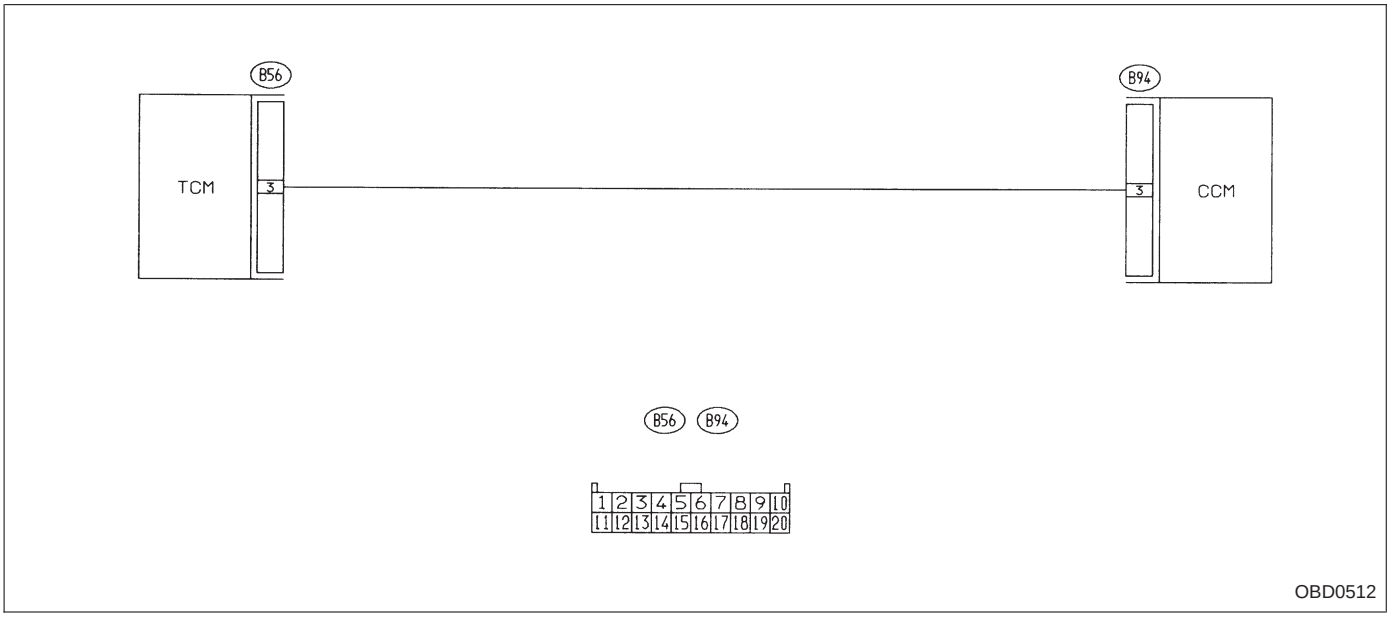
OBD (FB1)
P1701 <ATCRS>
B2M0669

CZ: DTC P1701 — CRUISE CONTROL SET SIGNAL CIRCUIT MALFUNCTION FOR AUTOMATIC TRANSMISSION —

DTC DETECTING CONDITION:

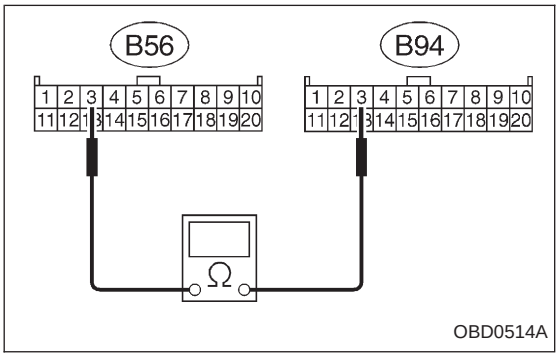
- Two consecutive driving cycles with fault

WIRING DIAGRAM:



OBD0512

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



OBD0514A

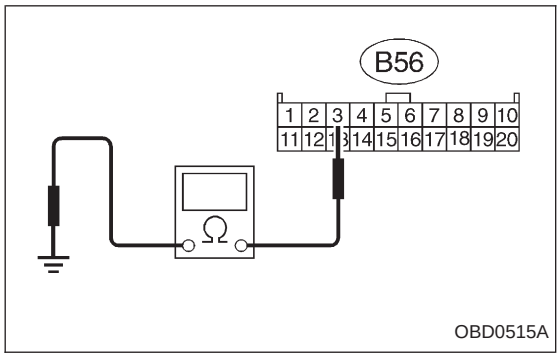
10CZ1	**CHECK HARNESS BETWEEN TCM AND CCM CONNECTOR.**

1) Turn ignition switch to OFF.
2) Disconnect connectors from TCM and CCM.
3) Measure resistance of harness between TCM and CCM connector.

CHECK ***: Connector & terminal (B56) No. 3 — (B94) No. 3: Is the resistance less than 1 Ω?***

YES : Go to next step 4).

NO : Repair open circuit in harness between TCM and CCM connector.

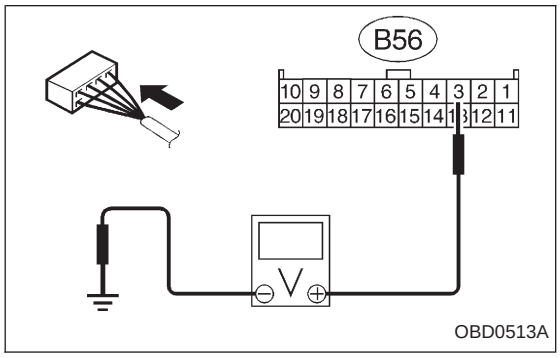


4) Measure resistance of harness between TCM and chassis ground.

CHECK ***: Connector & terminal (B56) No. 3 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair short circuit in harness between TCM and CCM connector.

NO : Go to step **10CZ2**.



10CZ2	CHECK INPUT SIGNAL FOR TCM.

1) Connect connector to TCM and CCM.
2) Lift-up the vehicle or set the vehicle on free rollers.

CAUTION:
On AWD models, raise all wheels off ground.

3) Start the engine.
4) Cruise control main switch to ON.
5) TCS OFF switch to ON. (with TCS models only)
6) Move selector lever to “D” and slowly increase vehicle speed to 50 km/h (31 MPH).
7) Cruise control set switch to ON.
8) Measure voltage between TCM and chassis ground.

CHECK ***: Connector & terminal (B56) No. 3 (+) — Chassis ground (−): Is the resistance less than 1 V?***

YES : Go to next CHECK .

NO : Check cruise control set circuit. <Ref. to 6-2 [T7A0].>

CHECK ***: Is there poor contact in TCM connector?***

YES : Repair poor contact in TCM connector.

NO : Replace TCM.

OBD (FB1)

P1702<ATDIAG_LO>

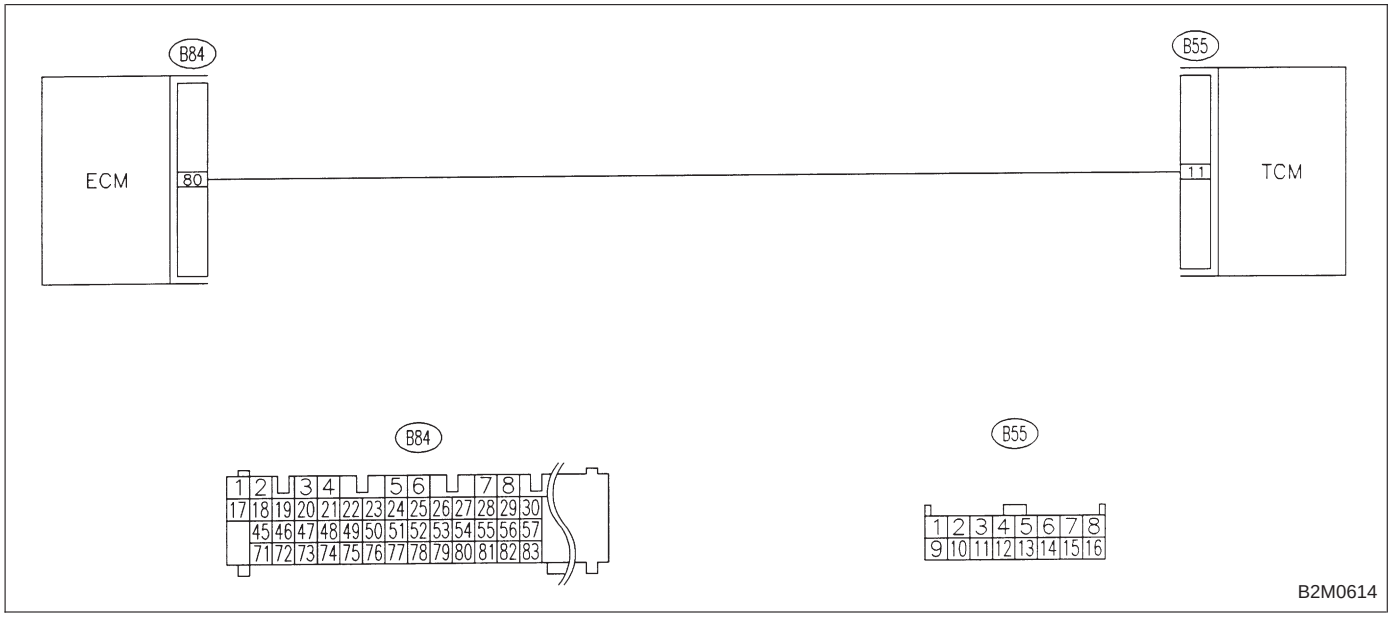
B2M1143

DA: DTC P1702 — AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT LOW INPUT —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



B2M0614

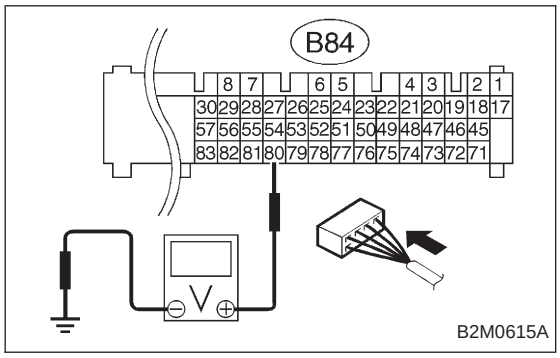
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10DA1	CHECK TRANSMISSION TYPE.

CHECK ***: Is transmission type AT?***

YES : Go to step **10DA2**.

NO : Check AT/MT identification circuit. <Ref. to 2-7 [T10DD0].>



10DA2	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

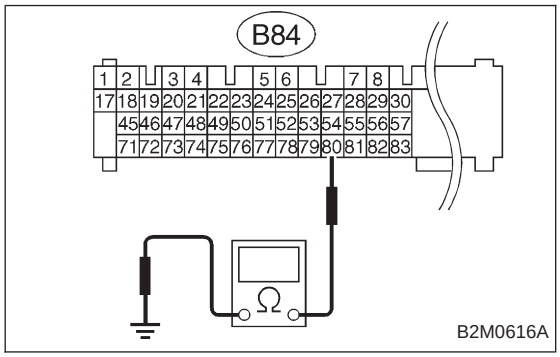
1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 80 (+) — Chassis ground (−): Is the voltage less than 1 V?***

YES : Go to step **10DA3**.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time.

NOTE:
In this case, repair the following:
- Poor contact in ECM connector
- Poor contact in TCM connector



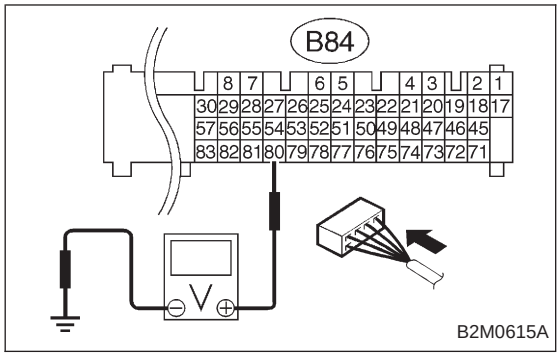
10DA3	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from ECM and TCM.
3) Measure resistance of harness between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 80 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between ECM and TCM connector.

NO : Go to step **10DA4**.



10DA4	CHECK ECM.

1) Connect connector to ECM.
2) Turn ignition switch to ON.
3) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 80 (+) — Chassis ground (−): Is the voltage more than 5 V?***

YES : Replace TCM.

NO : Replace ECM.

OBD (FB1)

P1722<ATDIAG_HI>

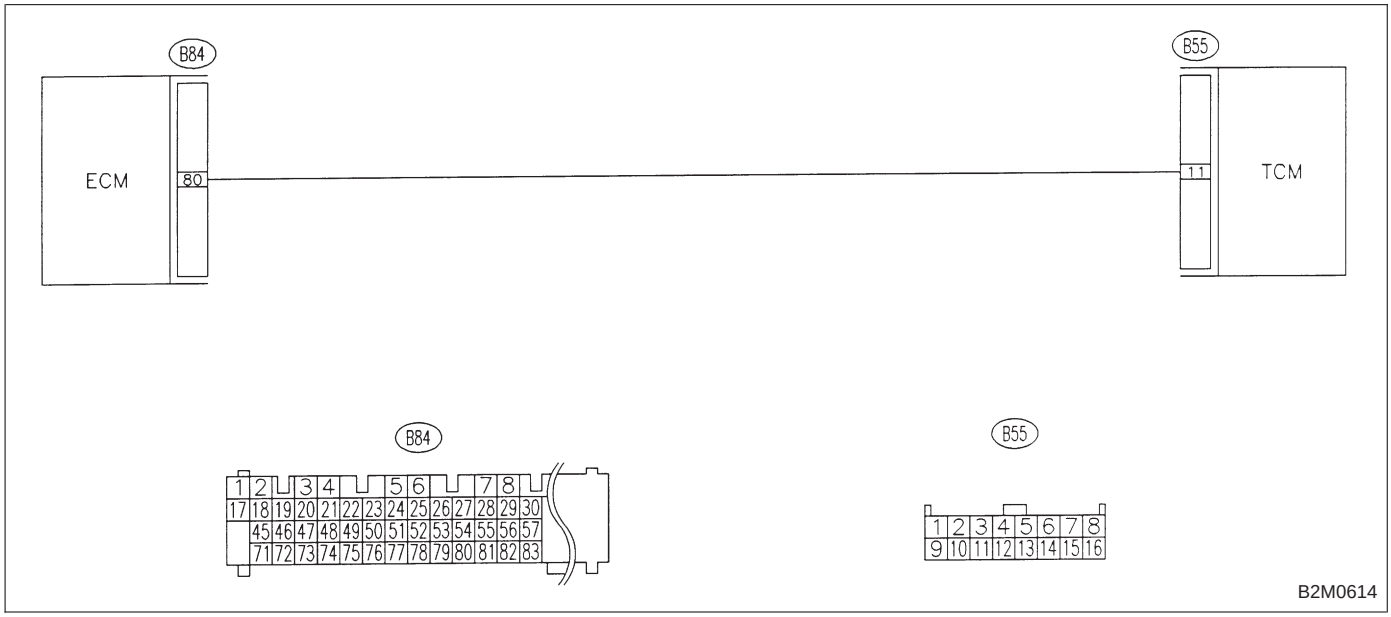
B2M1144

DB: DTC P1722 — AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT HIGH INPUT —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



B2M0614

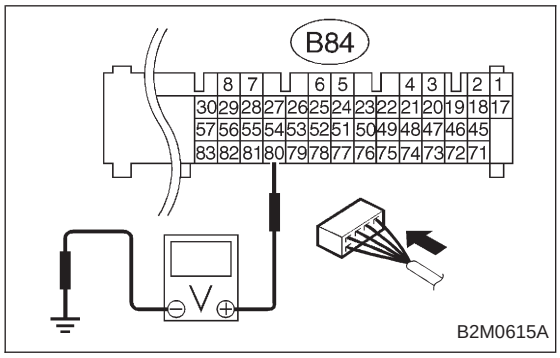
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10DB1	CHECK TRANSMISSION TYPE.

CHECK ***: Is transmission type AT?***

YES : Go to step **10DB2**.

NO : Check AT/MT identification circuit. <Ref. to 2-7 [T10DD0].>



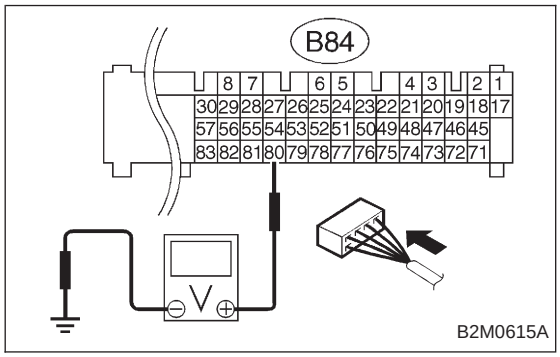
10DB2	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 80 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and TCM connector. After repair, replace ECM.

NO : Go to step **10DB3**.



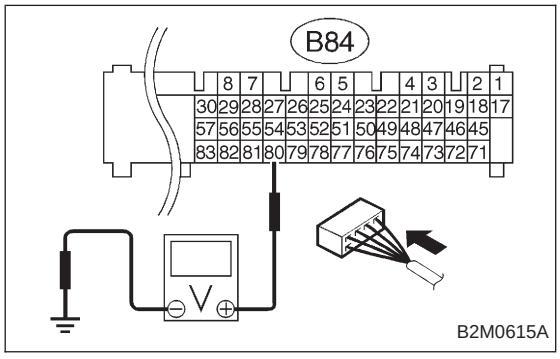
10DB3	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

Measure voltage between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 80 (+) — Chassis ground (−): Is the voltage more than 4 V?***

YES : Go to step **10DB4**.

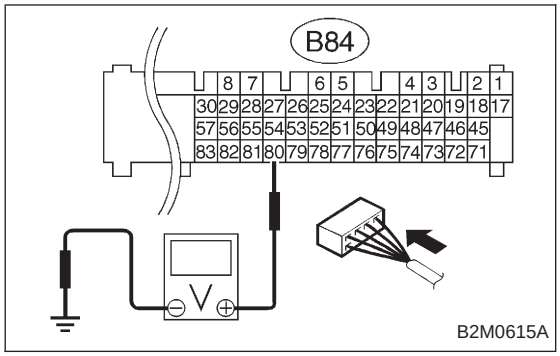
NO : Go to next CHECK .



CHECK ***: Connector & terminal (B84) No. 80 (+) — Chassis ground (−): Is the voltage less than 1 V?***

YES : Repair poor contact in ECM connector.

NO : Go to next CHECK .



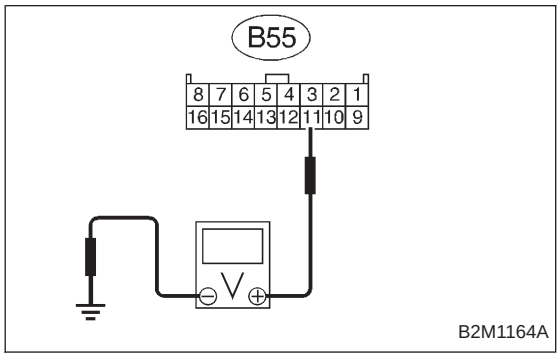
CHECK ***: Connector & terminal (B84) No. 80 (+) — Chassis ground (−): Does the voltage change from 1 V to 4 V while monitoring the value with voltage meter?***

YES : Even if MIL lights up, the circuit has returned to a normal condition at this time.

NOTE:
In this case, repair the following:
- Poor contact in ECM connector
- Poor contact in TCM connector

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.



10DB4	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

Measure voltage between TCM and chassis ground.

CHECK ***: Connector & terminal (B55) No. 11 (+) — Chassis ground (−): Is the voltage more than 4 V?***

YES : Go to next CHECK .

NO : Repair open circuit in harness between ECM and TCM connector.

CHECK ***: Is there poor contact in TCM connector?***

YES : Repair poor contact in TCM connector.

NO : Check TCM power supply line and grounding line.

OBD (FB1)

P1742 <ATDIAG_2>

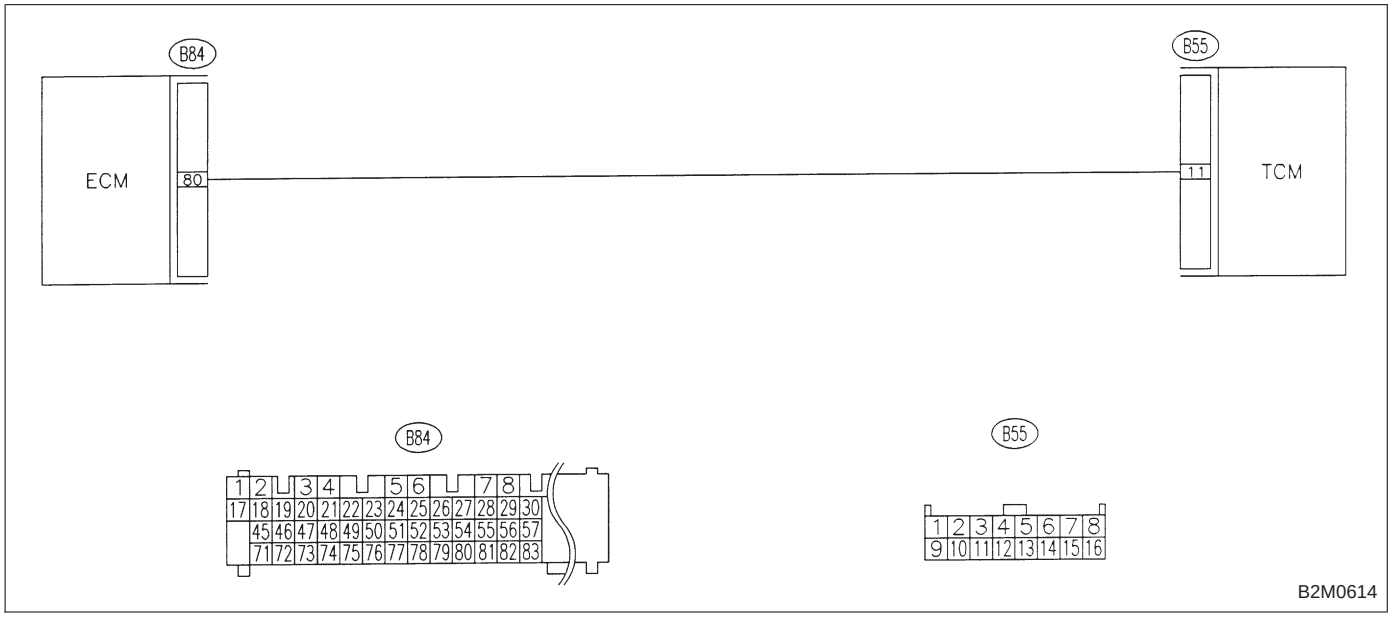
B2M1147

DC: DTC P1742 — AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT MALFUNCTION —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



B2M0614

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10DC1	CHECK TRANSMISSION TYPE.

CHECK ***: Is transmission type AT?***
YES : Go to step **10DC2**.
NO : Check AT/MT identification circuit. <Ref. to 2-7 [T10DD0].>

10DC2	CHECK DRIVING CONDITION.

1) Start and warm-up the engine until the radiator fan makes one complete rotation.
2) Drive the vehicle.

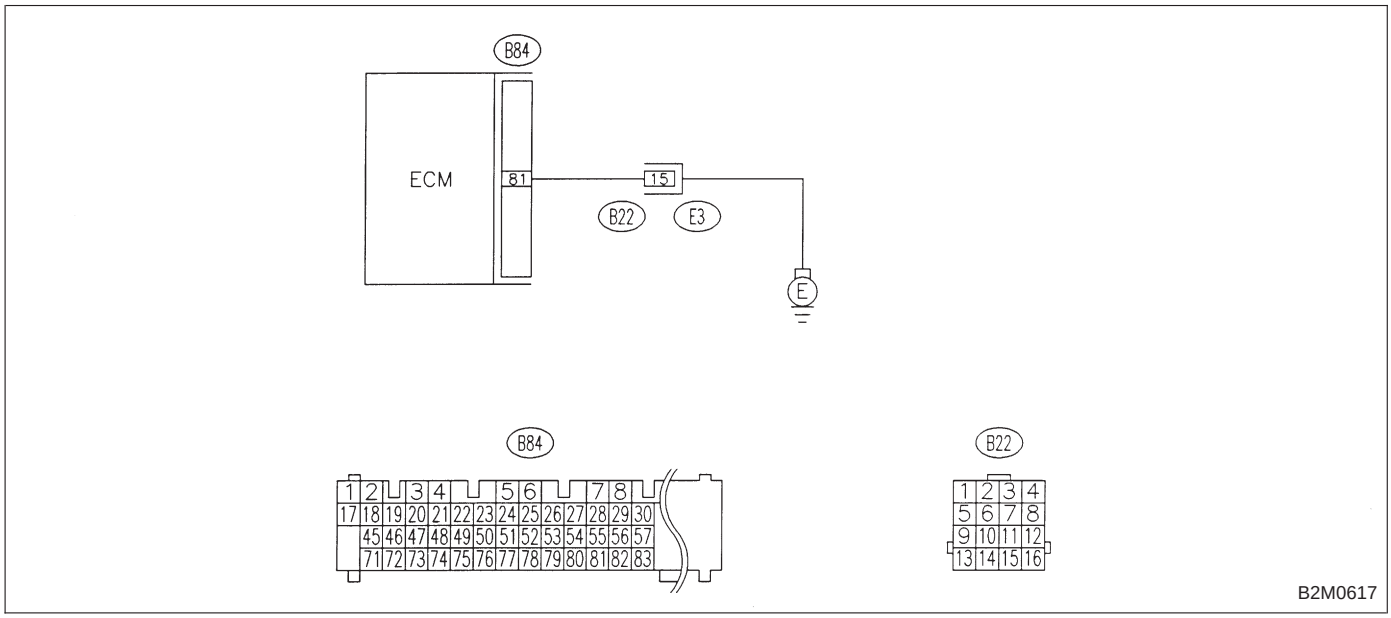
CHECK ***: Is AT shift control functioning properly?***
YES : Go to step **10DC3**.
NO : Replace TCM.

10DC3	CHECK ACCESSORY.

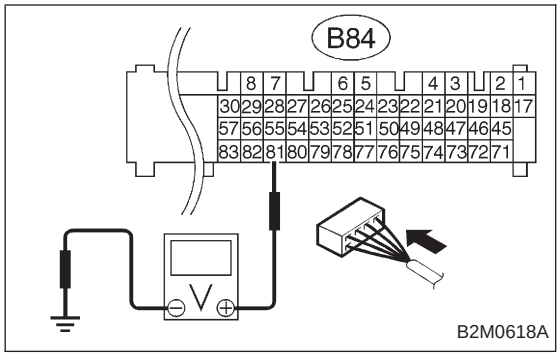
CHECK ***: Are car phone and/or CB installed on vehicle?***
YES : Repair grounding line of car phone or CB system.
NO : Replace TCM.

DD: — AT/MT IDENTIFICATION CIRCUIT MALFUNCTION [MT VEHICLES] —

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



10DD1	CHECK HARNESS BETWEEN ECM CONNECTOR AND ENGINE GROUNDING TERMINAL.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 81 (+) — Chassis ground (−): Is the voltage more than 2 V?***

YES : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM connector and engine grounding terminal
- Poor contact in engine grounding terminal
- Poor contact in coupling connector (B22)

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

11. Diagnostic Chart with Trouble Code for RHD Vehicles

A: DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC No.	Abbreviation (Subaru Select Monitor)	Item	Page
P0101	QA—RLOW	Mass air flow sensor circuit range/performance problem (low input)	426
P0102	QA—LOW	Mass air flow sensor circuit low input	427
P0103	QA—HI	Mass air flow sensor circuit high input	428
P0106	PS—R2	Pressure sensor circuit range/performance problem	429
P0107	P—SLOW	Pressure sensor circuit low input	430
P0108	P—SHI	Pressure sensor circuit high input	431
P0116	TW—LOW	Engine coolant temperature sensor circuit low input	432
P0117	TW—HI	Engine coolant temperature sensor circuit high input	433
P0121	TH—RHI	Throttle position sensor circuit range/performance problem (high input)	434
P0122	THV—LOW	Throttle position sensor circuit low input	435
P0123	THV—HI	Throttle position sensor circuit high input	436
P0125	TW—CL	Insufficient coolant temperature for closed loop fuel control	437
P0130	FO2—V	Front oxygen sensor circuit malfunction	438
P0133	FO2—R	Front oxygen sensor circuit slow response	439
P0135	FO2H	Front oxygen sensor heater circuit malfunction	440
P0136	RO2—V	Rear oxygen sensor circuit malfunction	441
P0139	RO2—R	Rear oxygen sensor circuit slow response	442
P0141	RO2H	Rear oxygen sensor heater circuit malfunction	443
P0170	FUEL	Fuel trim malfunction	444
P0181	TNKT—F	Fuel temperature sensor A circuit range/performance problem	445
P0182	TNKT—LOW	Fuel temperature sensor A circuit low input	447
P0183	TNKT—HI	Fuel temperature sensor A circuit high input	450
P0261	INJ1	Fuel injector circuit low input - #1	453
P0262	INJ1—HI	Fuel injector circuit high input - #1	455
P0264	INJ2	Fuel injector circuit low input - #2	453
P0265	INJ2—HI	Fuel injector circuit high input - #2	455
P0267	INJ3	Fuel injector circuit low input - #3	453
P0268	INJ3—HI	Fuel injector circuit high input - #3	455
P0270	INJ4	Fuel injector circuit low input - #4	453
P0271	INJ4—HI	Fuel injector circuit high input - #4	455
P0301	MIS—1	Cylinder 1 misfire detected	457
P0302	MIS—2	Cylinder 2 misfire detected	457
P0303	MIS—3	Cylinder 3 misfire detected	457
P0304	MIS—4	Cylinder 4 misfire detected	457
P0325	KNOCK	Knock sensor circuit malfunction	459
P0335	CRANK	Crankshaft position sensor circuit malfunction	460
P0336	CRANK—R	Crankshaft position sensor circuit range/performance problem	461
P0340	CAM	Camshaft position sensor circuit malfunction	462

DTC No.	Abbreviation (Subaru Select Monitor)	Item	Page
P0341	CAM—R	Camshaft position sensor circuit range/performance problem	463
P0400	EGR	Exhaust gas recirculation flow malfunction	464
P0403	EGRSOL	Exhaust gas recirculation circuit low input	465
P0420	CAT	Catalyst system efficiency below threshold	466
P0440	EVAP	Evaporative emission control system malfunction	467
P0441	CPC—F	Evaporative emission control system incorrect purge flow	468
P0443	CPC	Evaporative emission control system purge control valve circuit low input	469
P0446	VCMSOL—LO	Evaporative emission control system vent control low input	470
P0451	TNKP—F	Evaporative emission control system pressure sensor range/performance problem	473
P0452	TNKP—LOW	Evaporative emission control system pressure sensor low input	474
P0453	TNKP—HI	Evaporative emission control system pressure sensor high input	479
P0461	FLVL—R	Fuel level sensor circuit range/performance problem	484
P0462	FLVL—LOW	Fuel level sensor circuit low input	486
P0463	FLVL—HI	Fuel level sensor circuit high input	492
P0500	VSP	Vehicle speed sensor malfunction	497
P0505	ISC	Idle control system malfunction	498
P0506	ISC—RLOW	Idle control system RPM lower than expected	499
P0507	ISC—RHI	Idle control system RPM higher than expected	500
P0600	—	Serial communication link malfunction	501
P0601	RAM	Internal control module memory check sum error	502
P0703	ATBRK	Brake switch input malfunction	503
P0705	ATRNG	Transmission range sensor circuit malfunction	504
P0710	ATF	Transmission fluid temperature sensor circuit malfunction	505
P0720	ATVSP	Output speed sensor (vehicle speed sensor 1) circuit malfunction	506
P0725	ATNE	Engine speed input circuit malfunction	507
P0731	ATGR1	Gear 1 incorrect ratio	508
P0732	ATGR2	Gear 2 incorrect ratio	508
P0733	ATGR3	Gear 3 incorrect ratio	508
P0734	ATGR4	Gear 4 incorrect ratio	508
P0740	ATLU—F	Torque converter clutch system malfunction	510
P0743	ATLU	Torque converter clutch system electrical	511
P0748	ATPL	Pressure control solenoid electrical	512
P0753	ATSFT1	Shift solenoid A electrical	513
P0758	ATSFT2	Shift solenoid B electrical	514
P0760	ATOVR—F	Shift solenoid C malfunction	515
P0763	ATOVR	Shift solenoid C electrical	516
P1100	ST—SWOFF	Starter switch circuit low input	517
P1101	N—SWOFF	Neutral position switch circuit high input [AT vehicles]	518
P1102	BR	Pressure sources switching solenoid valve circuit low input	519
P1103	TRQ	Engine torque control signal circuit malfunction	520
P1120	ST—SWON	Starter switch circuit high input	521
P1121	N—SWON	Neutral position switch circuit low input [AT vehicles]	522

DTC No.	Abbreviation (Subaru Select Monitor)	Item	Page
P1122	BR—HI	Pressure sources switching solenoid valve circuit high input	523
P1141	QA—RHI	Mass air flow sensor circuit range/performance problem (high input)	524
P1142	TH—RLOW	Throttle position sensor circuit range/performance problem (low input)	525
P1143	PS—RLOW	Pressure sensor circuit range/performance problem (low input)	526
P1144	PS—RHI	Pressure sensor circuit range/performance problem (high input)	527
P1400	PCVSOL—LO	Fuel tank pressure control solenoid valve circuit low input	528
P1420	PCVSOL—HI	Fuel tank pressure control solenoid valve circuit high input	532
P1421	EGRSOL—HI	Exhaust gas recirculation circuit high input	535
P1422	CPC—HI	Evaporative emission control system purge control valve circuit high input	536
P1423	VCMSOL—HI	Evaporative emission control system vent control high input	537
P1440	PCV—FLOW	Fuel tank pressure control system function problem (low input)	540
P1441	PCV—FHI	Fuel tank pressure control system function problem (high input)	541
P1442	FLVL—R2	Fuel level sensor circuit range/performance problem 2	542
P1500	FAN—1	Radiator fan relay 1 circuit low input	544
P1502	FAN—F	Radiator fan function problem	545
P1507	ISC—SHI	Idle control system malfunction (fail-safe)	546
P1520	FAN—1HI	Radiator fan relay 1 circuit high input	547
P1540	VSP—S	Vehicle speed sensor malfunction 2	548
P1700	ATTH	Throttle position sensor circuit malfunction for automatic transmission	549
P1701	ATCRS	Cruise control set signal circuit malfunction for automatic transmission	550
P1702	ATDIAG—LO	Automatic transmission diagnosis input signal circuit low input	551
P1722	ATDIAG—HI	Automatic transmission diagnosis input signal circuit high input	552
P1742	ATDIAG—2	Automatic transmission diagnosis input signal circuit malfunction	553

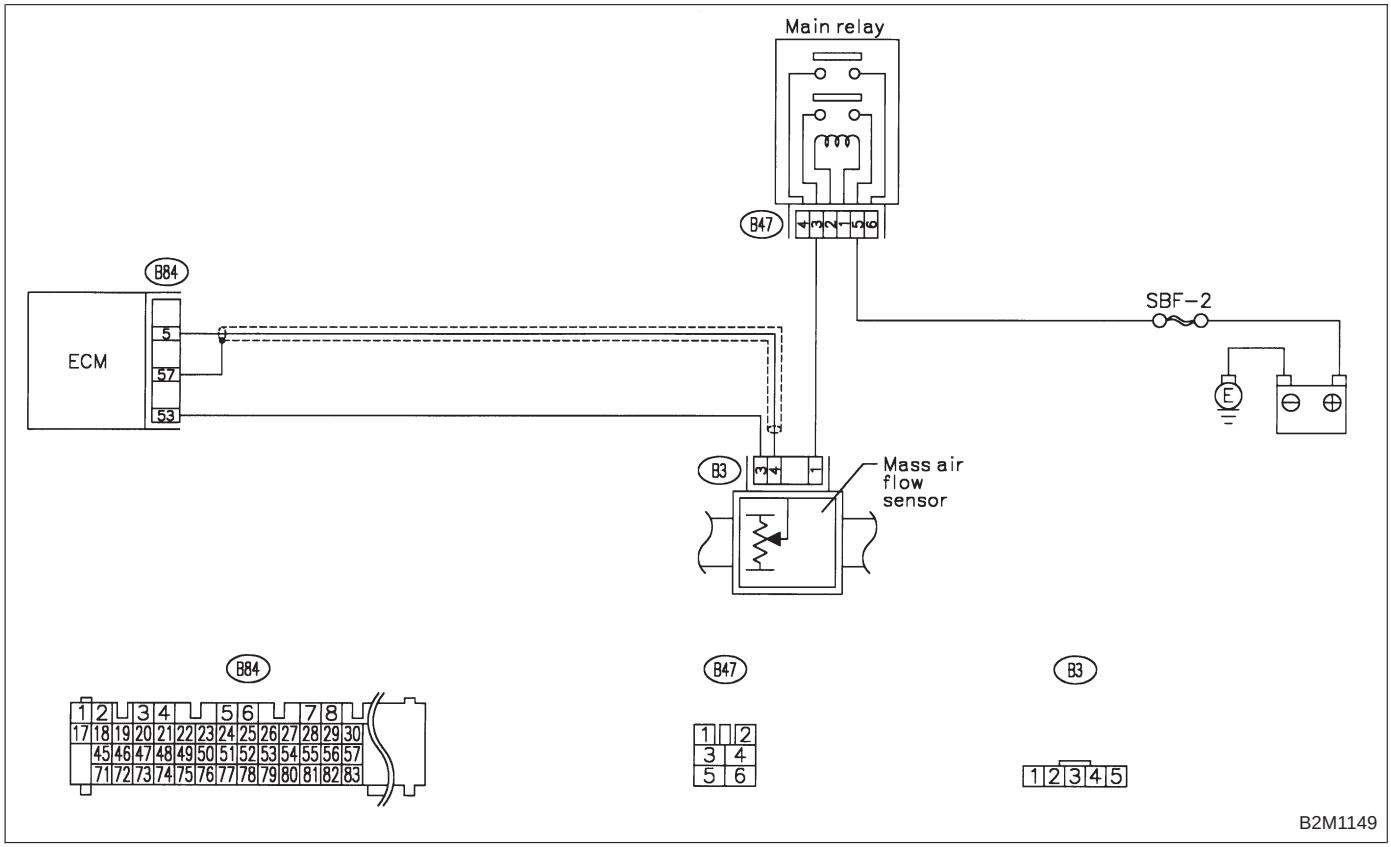
OBD (FB1)

P0101 <QA_RLOW>

B2M1056

B: DTC P0101 — MASS AIR FLOW SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) —

WIRING DIAGRAM:



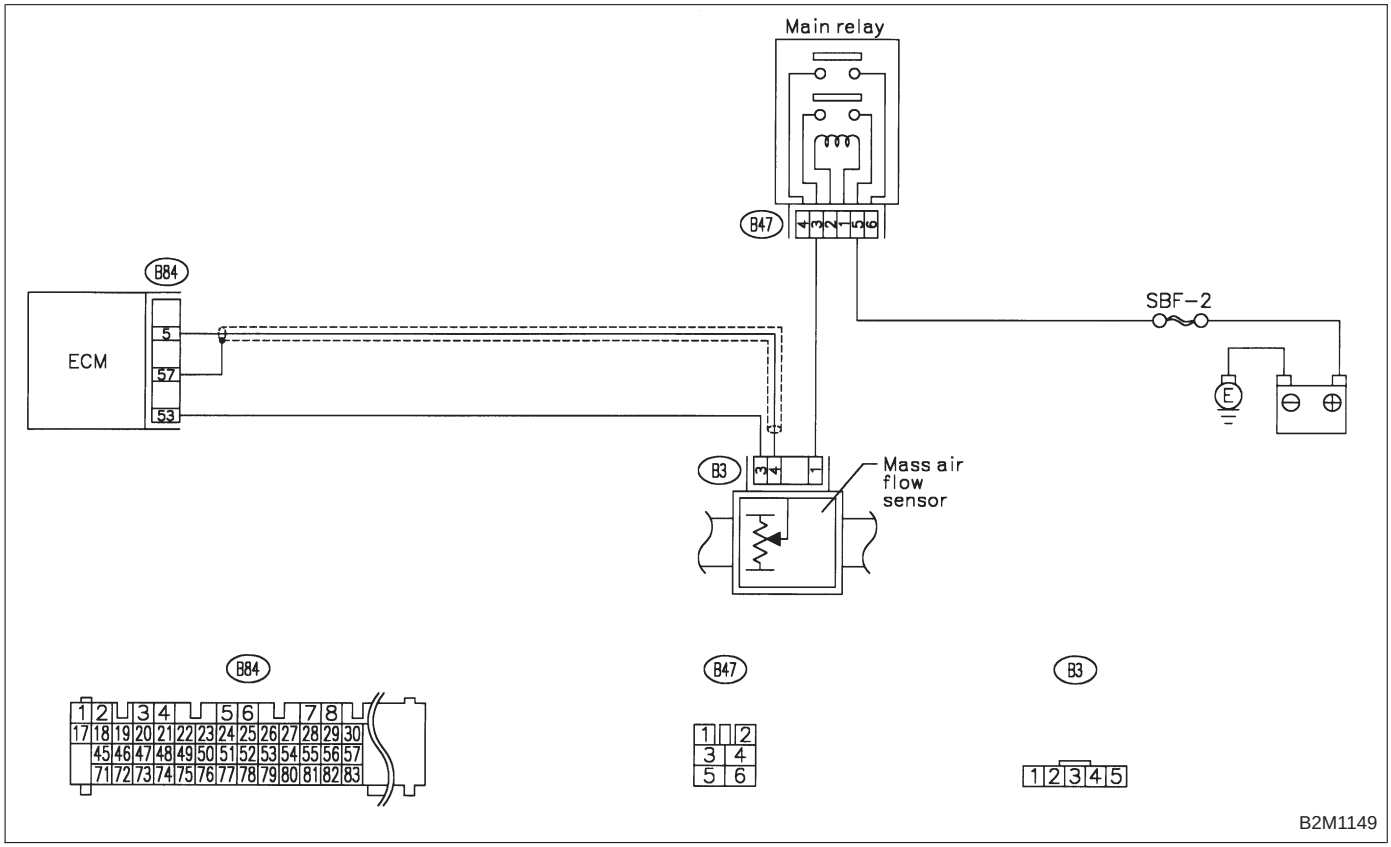
B2M1149

NOTE:
Check mass air flow sensor circuit.
<Ref. to 2-7 [T10B0].>

OBD (FB1)
P0102 <QA_LOW>
B2M1058

C: DTC P0102 — MASS AIR FLOW SENSOR CIRCUIT LOW INPUT —

WIRING DIAGRAM:



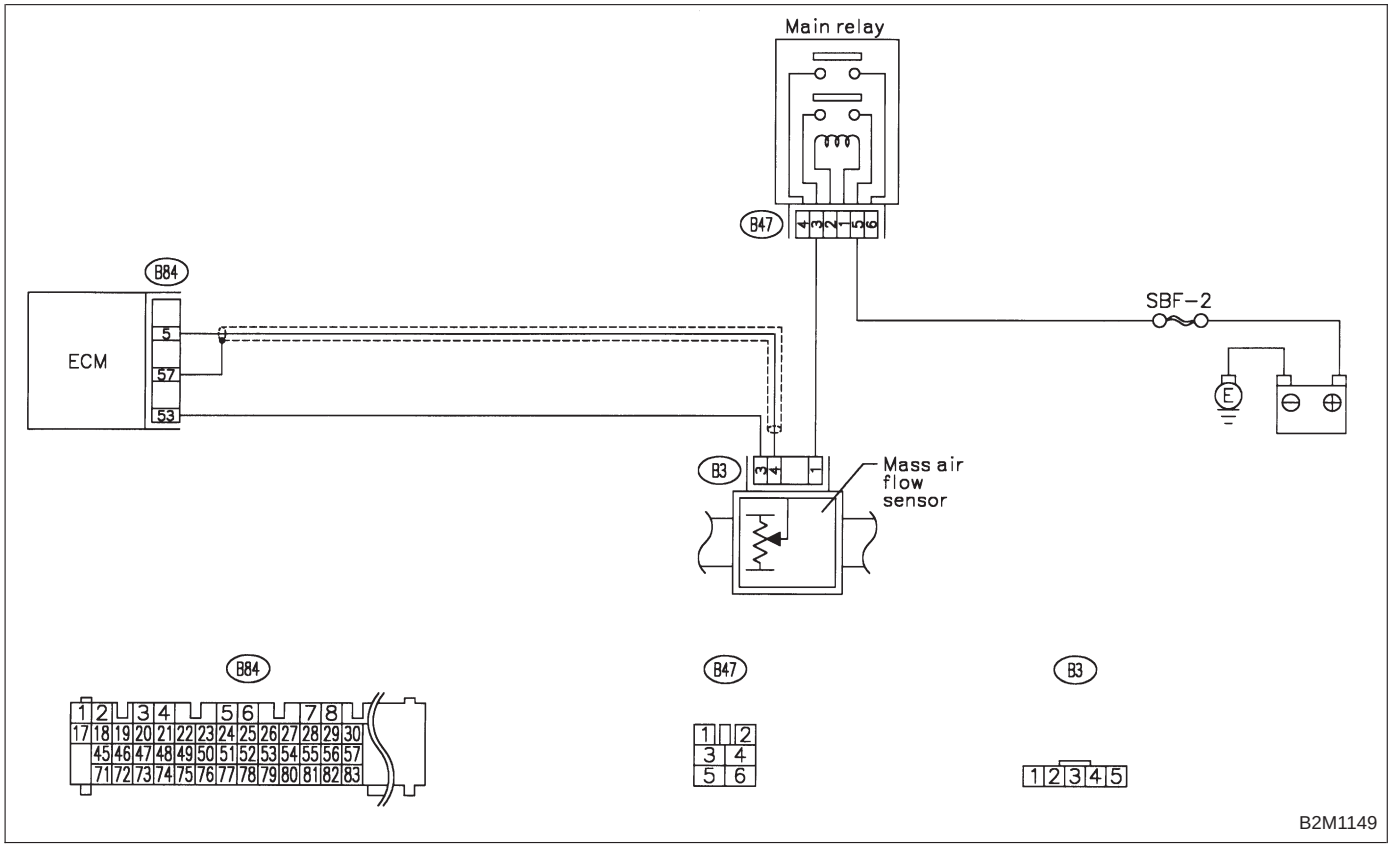
NOTE:
Check mass air flow sensor circuit.
<Ref. to 2-7 [T10C0].>

OBD (FB1)
P0103 <QA_HI>

B2M1061

D: DTC P0103 — MASS AIR FLOW SENSOR CIRCUIT HIGH INPUT —

WIRING DIAGRAM:



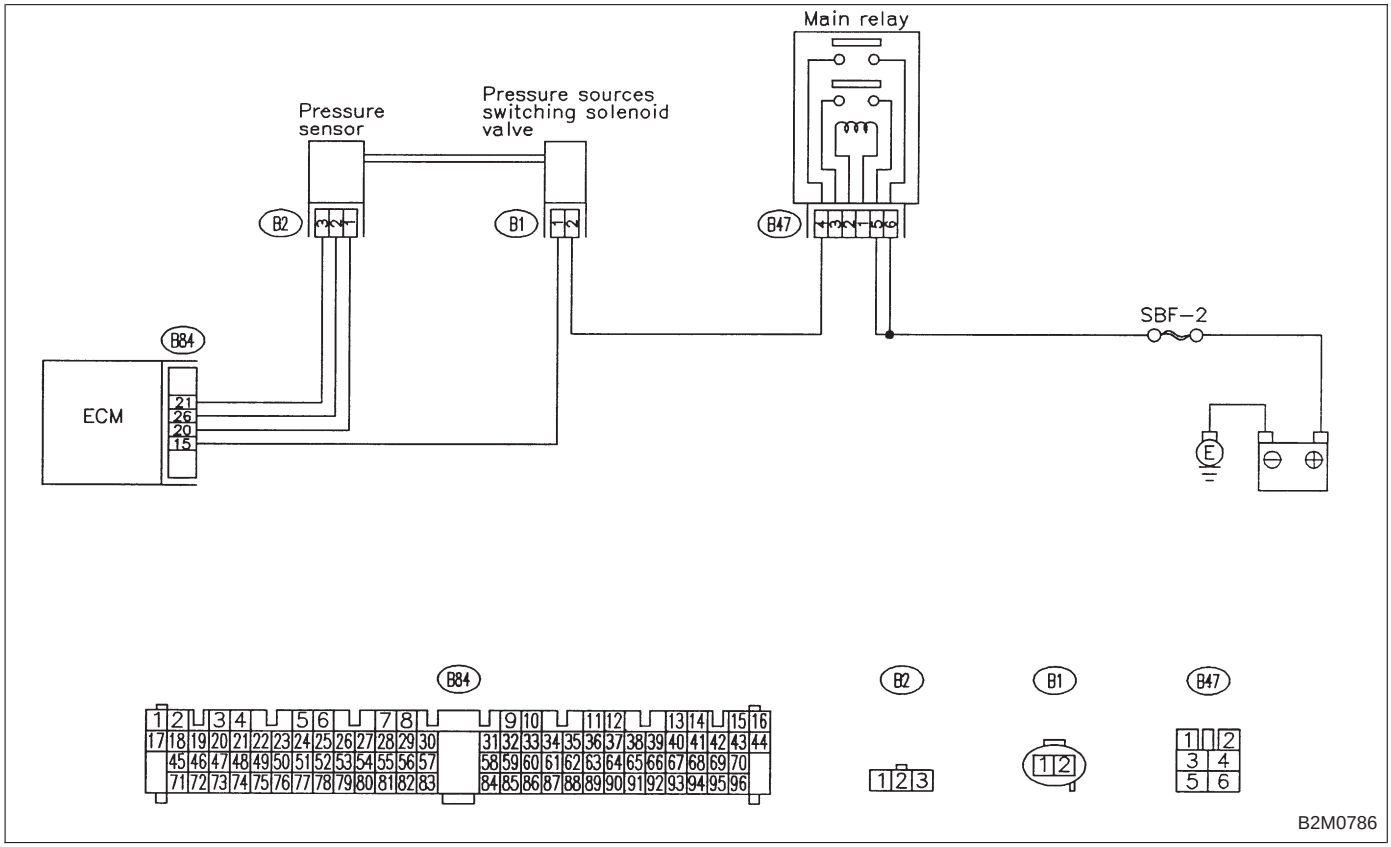
B2M1149

NOTE:
Check mass air flow sensor circuit.
<Ref. to 2-7 [T10D0].>

OBD (FB1)
P0106 <PS_R2>
B2M1062

E: DTC P0106 — PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —

WIRING DIAGRAM:



NOTE:
Check pressure sensor circuit.
<Ref. to 2-7 [T10E0].>

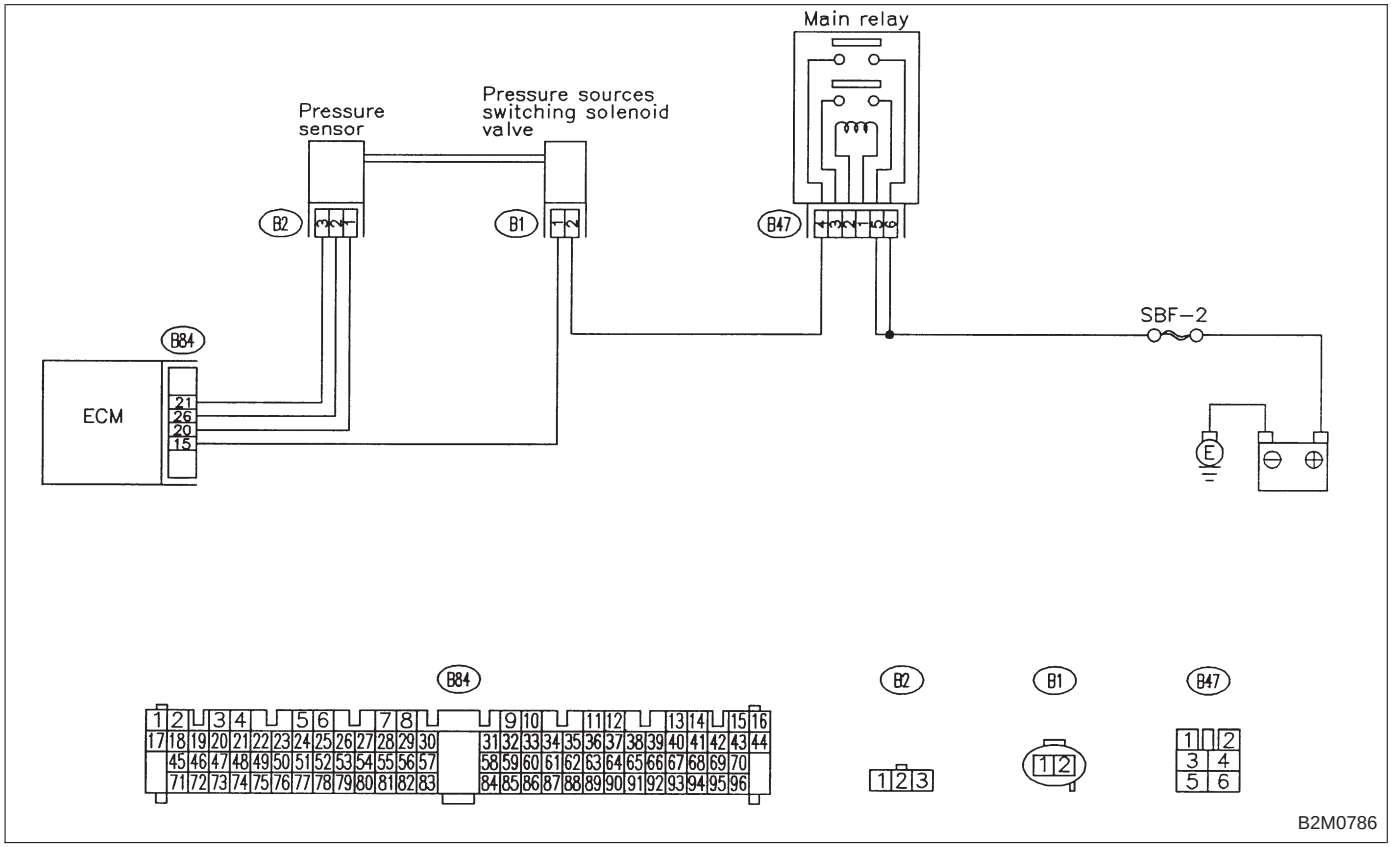
OBD (FB1)

P0107 <P_SLOW>

B2M1064

F: DTC P0107 — PRESSURE SENSOR CIRCUIT LOW INPUT —

WIRING DIAGRAM:



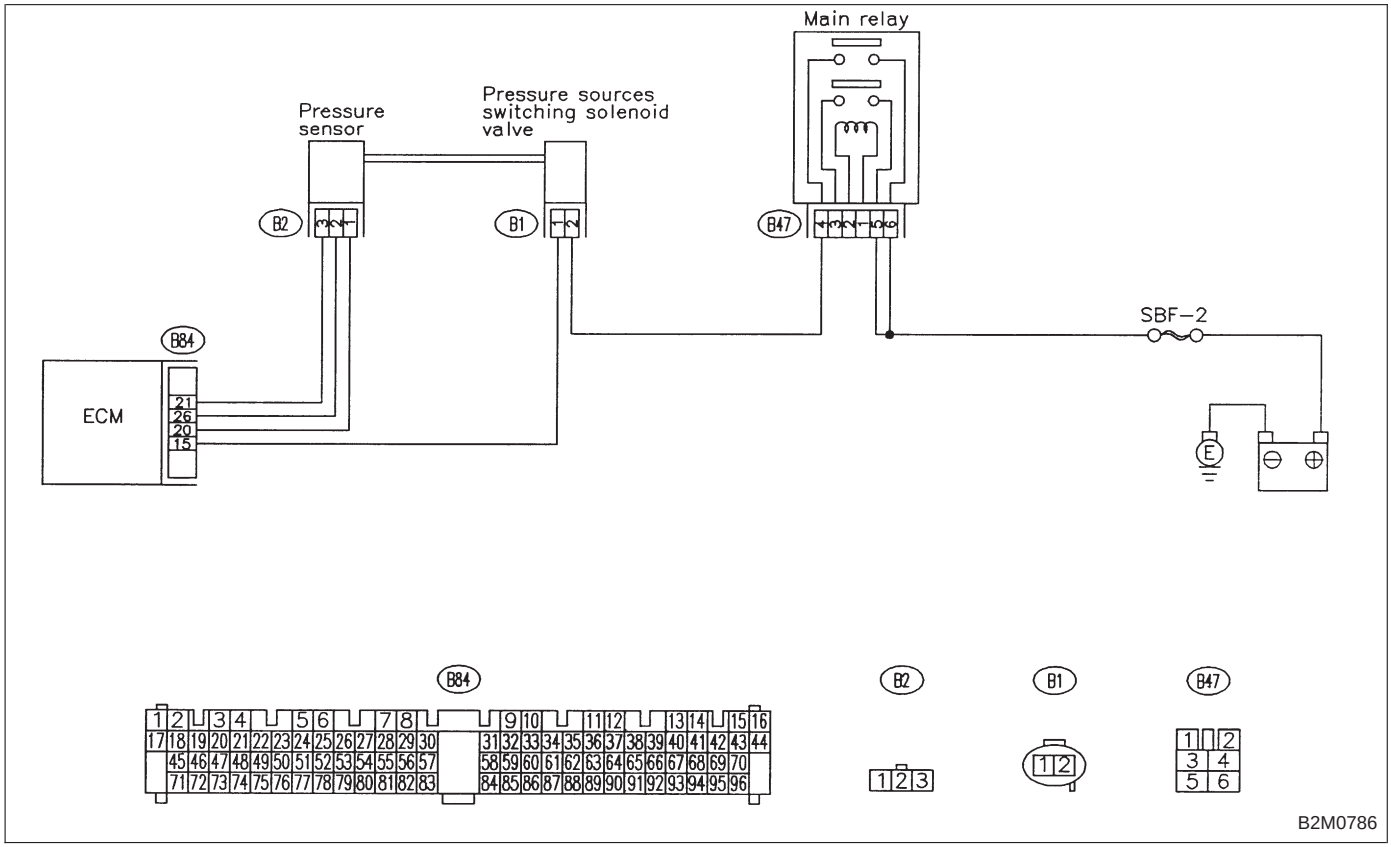
B2M0786

NOTE:
Check pressure sensor circuit.
<Ref. to 2-7 [T10F0].>

OBD (FB1)
P0108 <P_SHI>
B2M1066

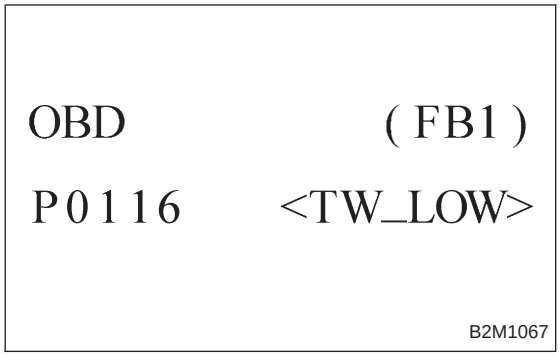
G: DTC P0108 — PRESSURE SENSOR CIRCUIT HIGH INPUT —

WIRING DIAGRAM:



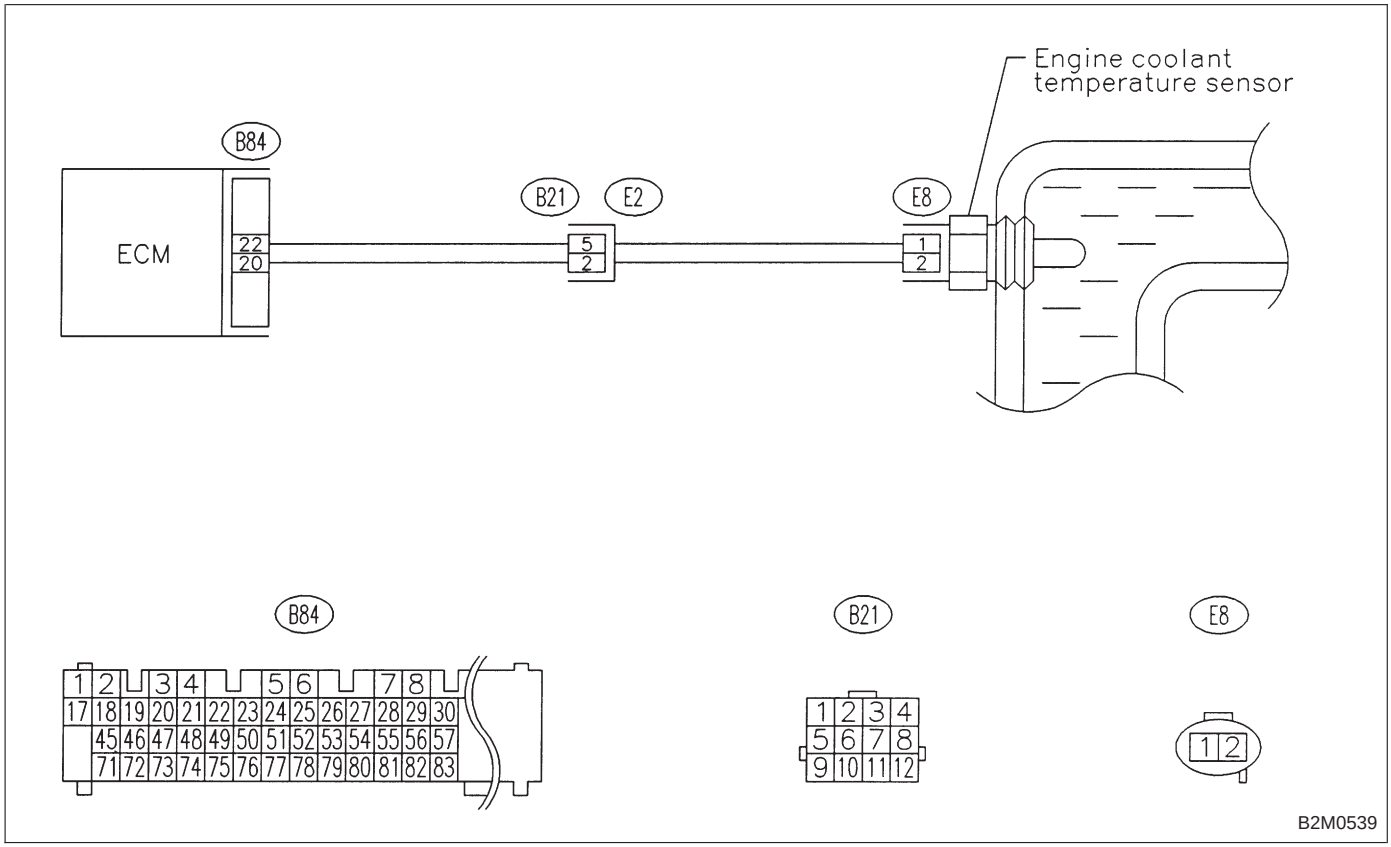
B2M0786

NOTE:
Check pressure sensor circuit.
<Ref. to 2-7 [T10G0].>



H: DTC P0116 — ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT LOW INPUT —

WIRING DIAGRAM:

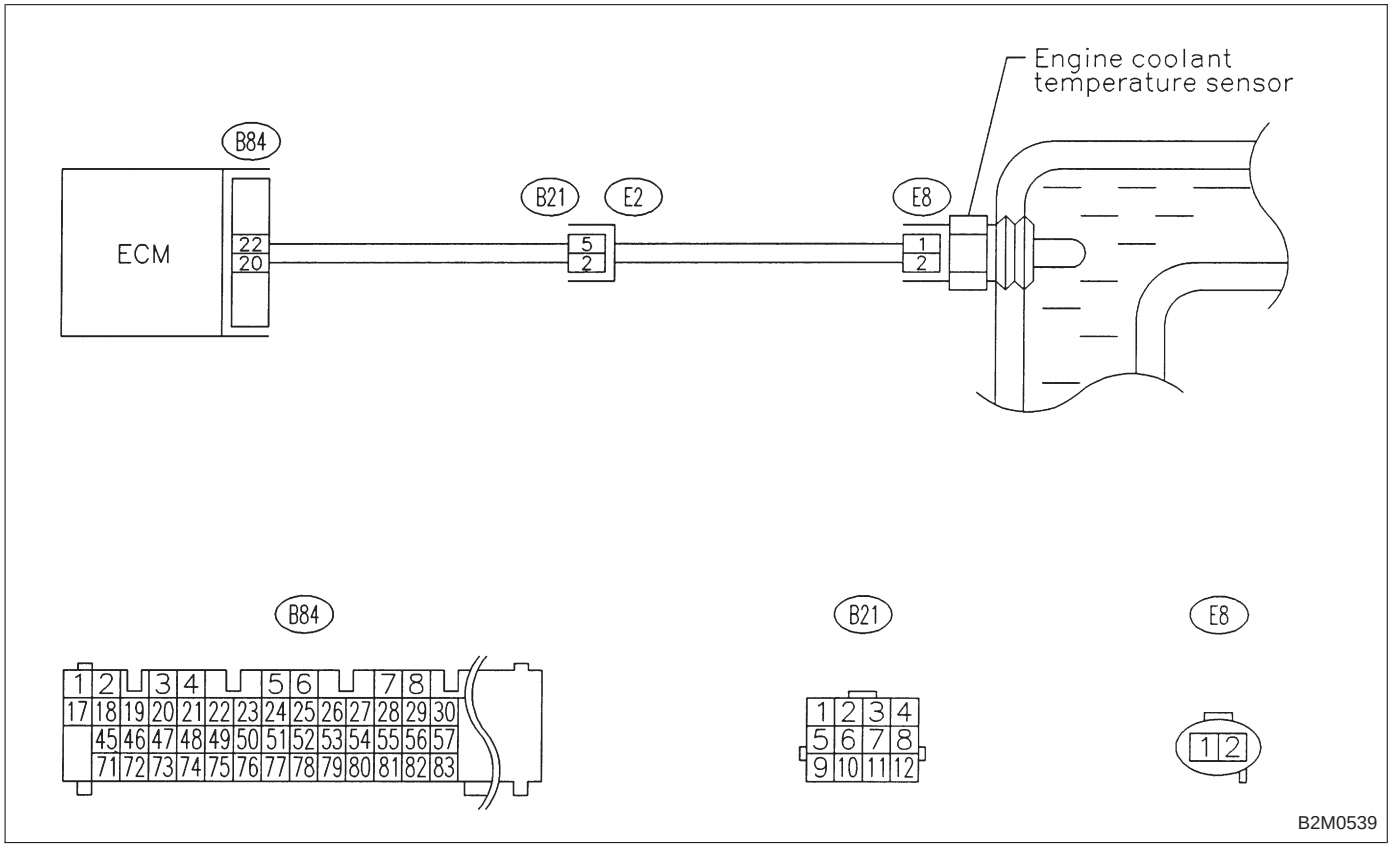


NOTE:
Check engine coolant temperature sensor circuit.
<Ref. to 2-7 [T10H0].>

OBD (FB1)
P0117 <TW_HI>
B2M1068

I: DTC P0117 — ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT HIGH INPUT —

WIRING DIAGRAM:



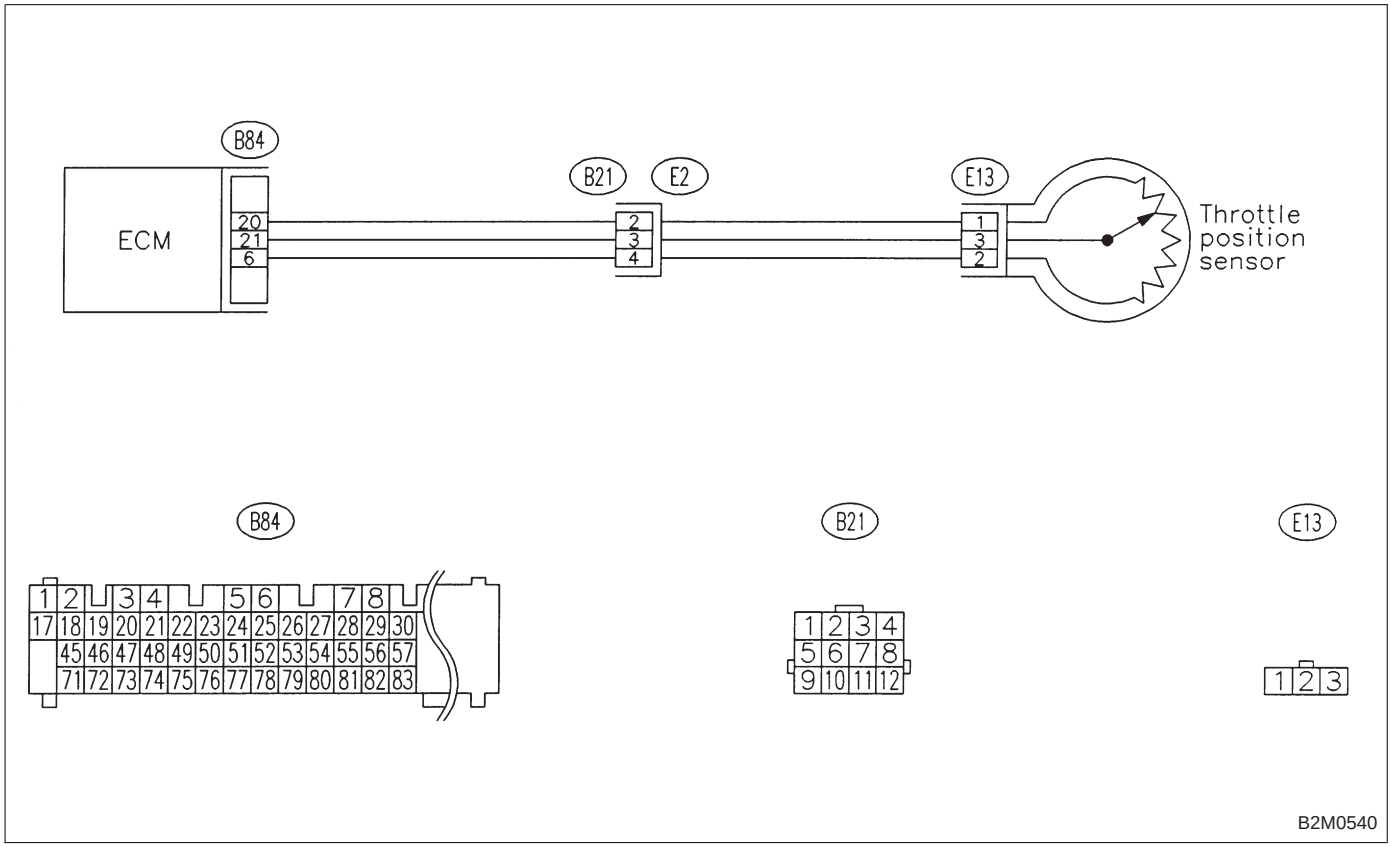
NOTE:
Check engine coolant temperature sensor circuit.
<Ref. to 2-7 [T10I0].>

OBD (FB1)
P0121 <TH_RHI>

B2M1069

J: DTC P0121 — THROTTLE POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) —

WIRING DIAGRAM:



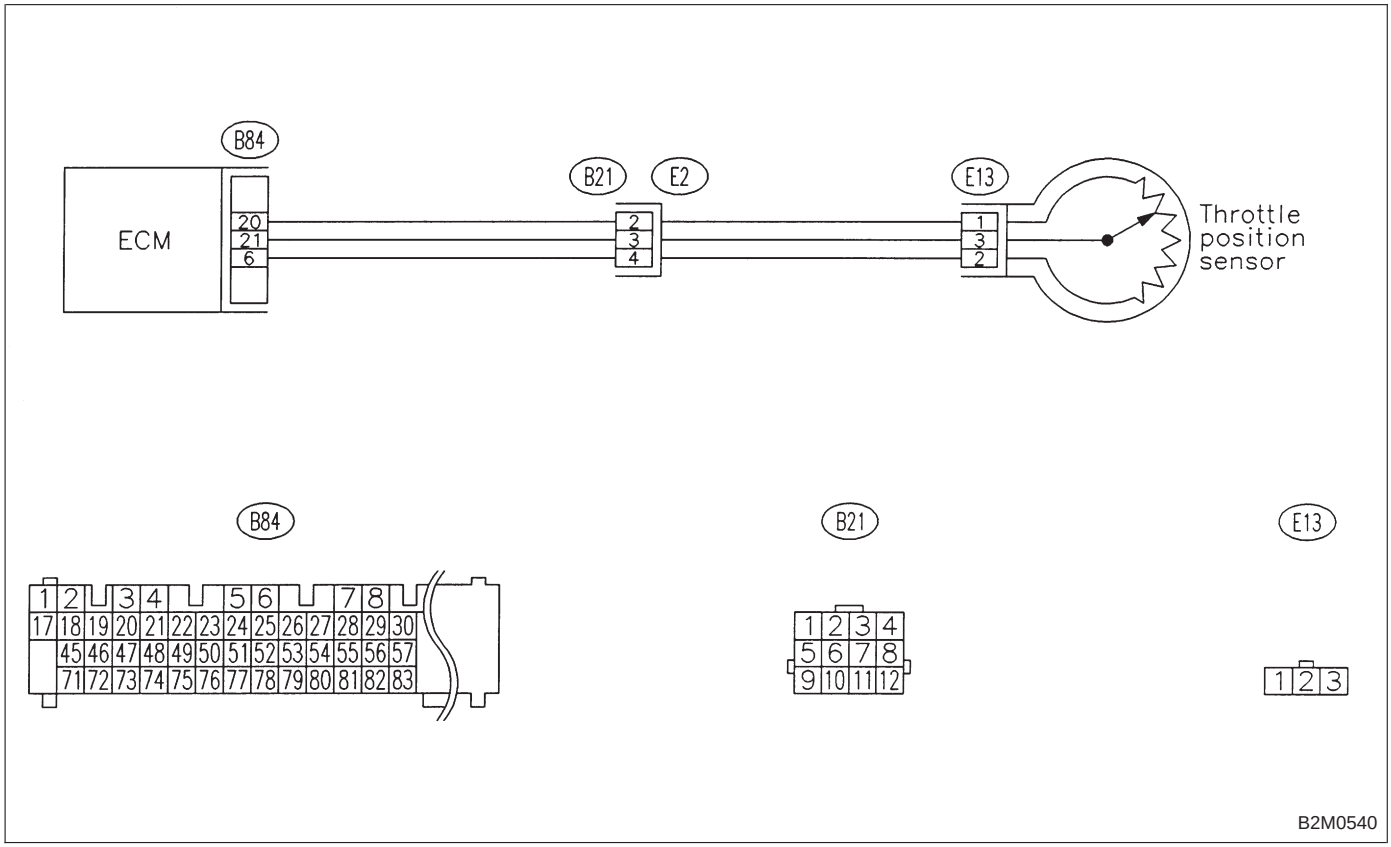
B2M0540

NOTE:
Check throttle position sensor circuit.
<Ref. to 2-7 [T10J0].>

OBD (FB1)
P0122 <THV_LOW>
B2M1070

K: DTC P0122 — THROTTLE POSITION SENSOR CIRCUIT LOW INPUT —

WIRING DIAGRAM:



B2M0540

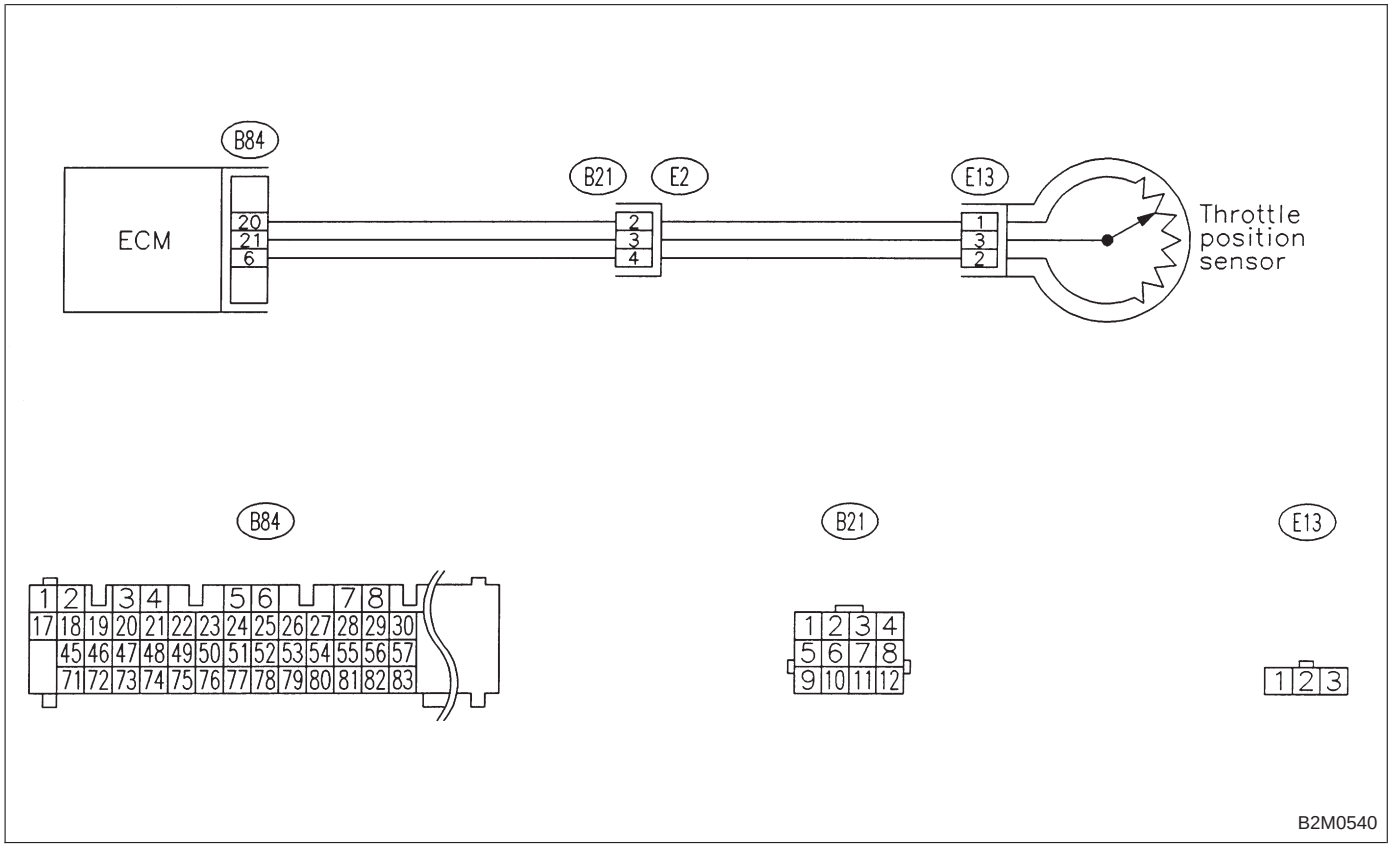
NOTE:
Check throttle position sensor circuit.
<Ref. to 2-7 [T10K0].>

OBD (FB1)
P0123 <THV_HI>

B2M1071

L: DTC P0123 — THROTTLE POSITION SENSOR CIRCUIT HIGH INPUT —

WIRING DIAGRAM:



B2M0540

NOTE:
Check throttle position sensor circuit.
<Ref. to 2-7 [T10L0].>

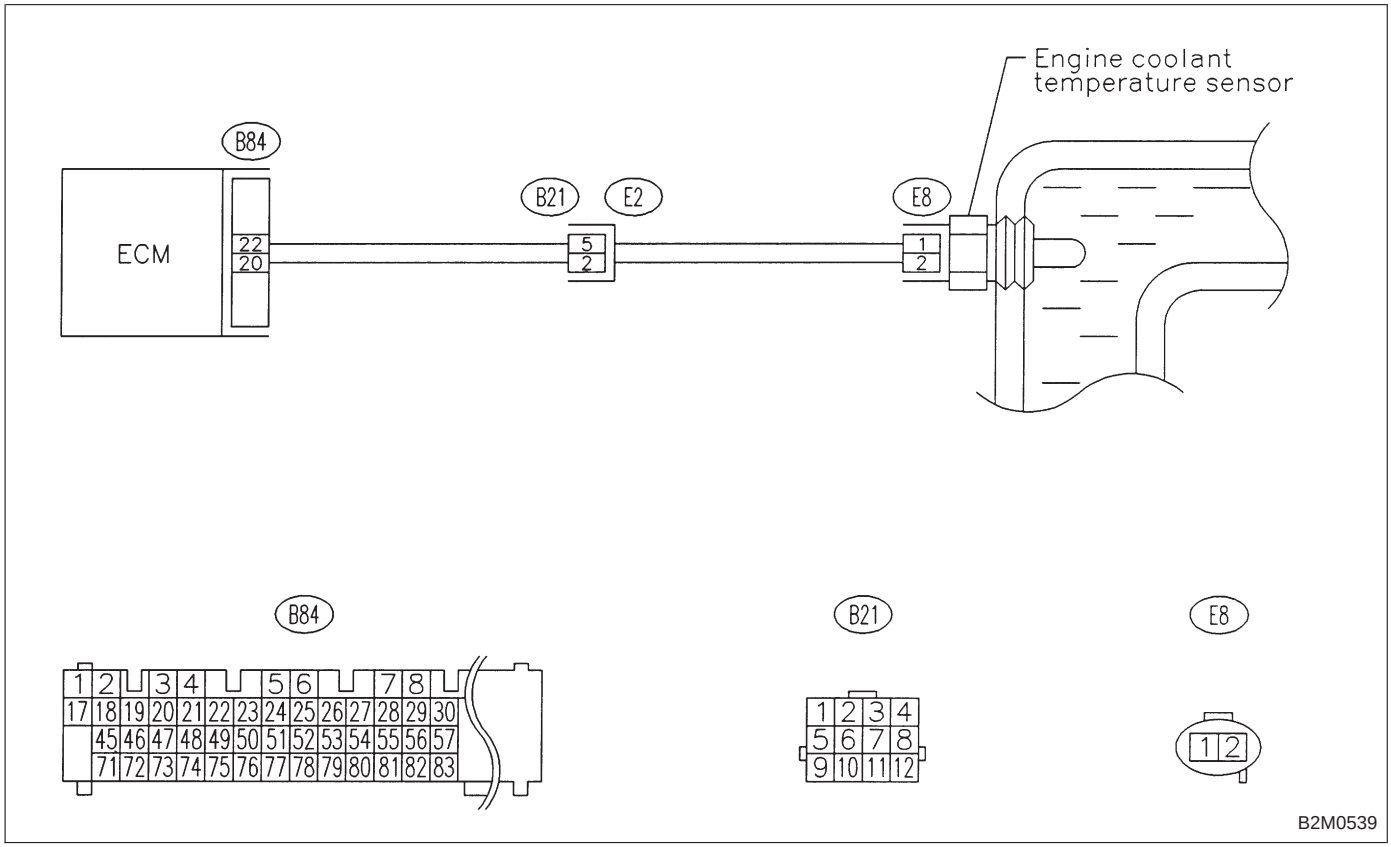
OBD (FB1)

P0125 <TW_CL>

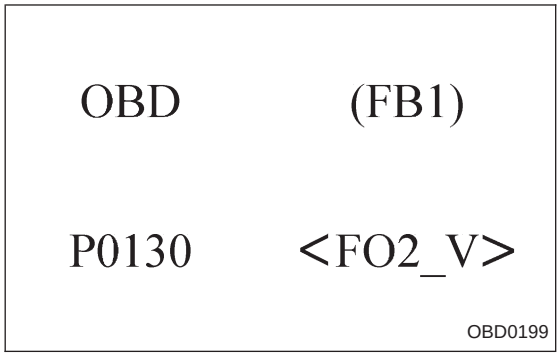
OBD0191

M: DTC P0125
— INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL —

WIRING DIAGRAM:

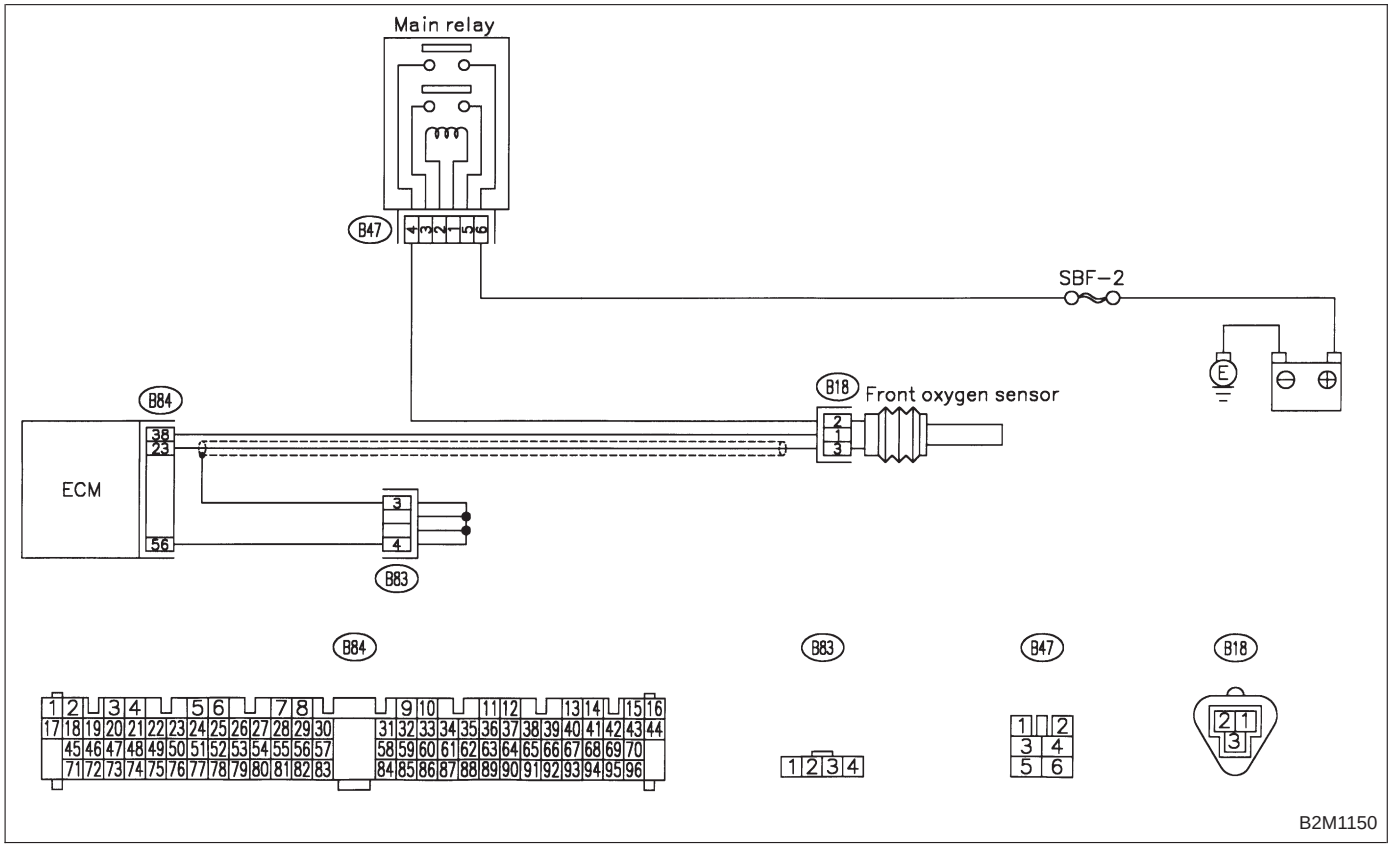


NOTE:
Check insufficient coolant temperature for closed loop fuel control.
<Ref. to 2-7 [T10M0].>



N: DTC P0130 — FRONT OXYGEN SENSOR CIRCUIT MALFUNCTION —

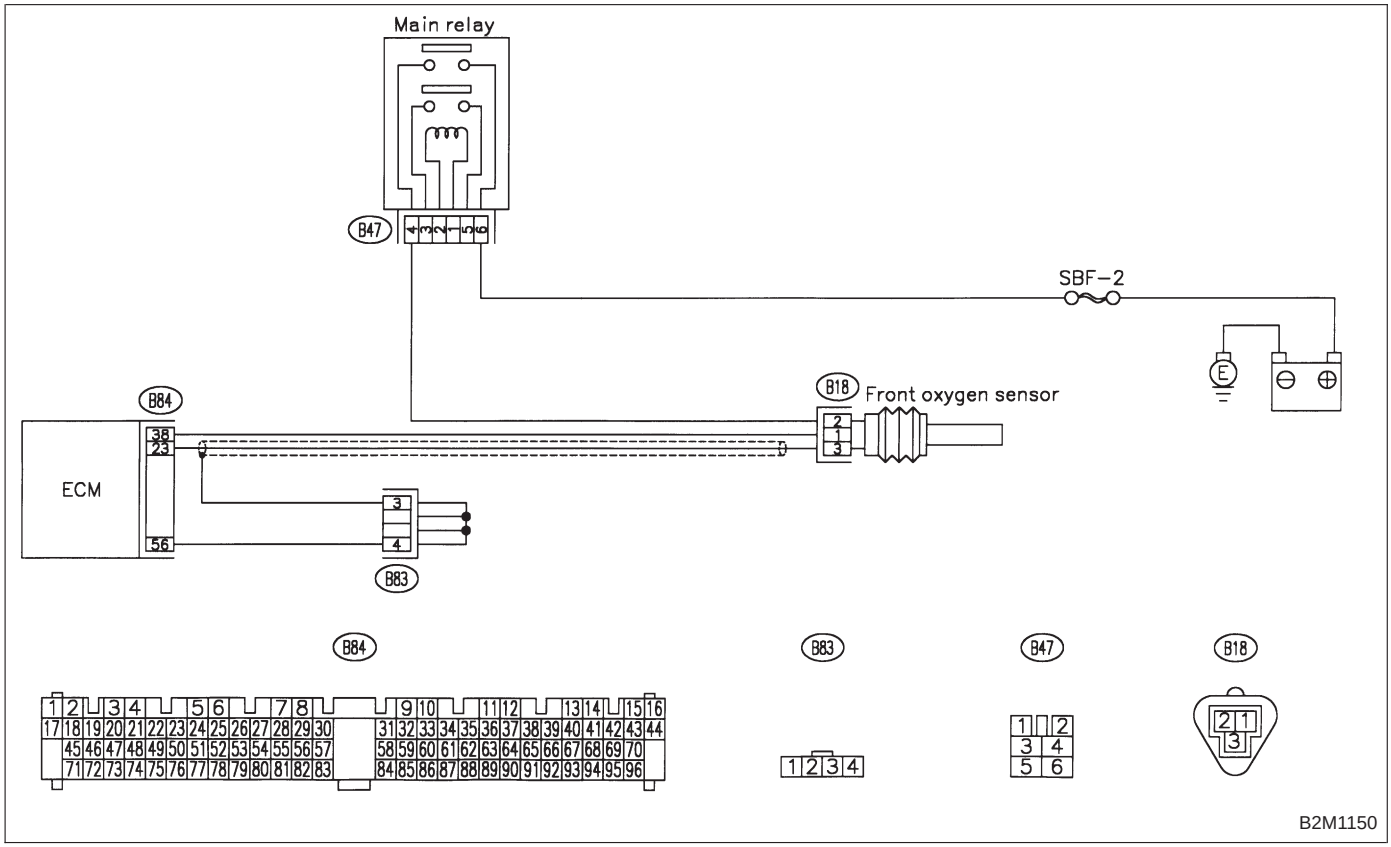
WIRING DIAGRAM:



NOTE:
Check front oxygen sensor circuit.
<Ref. to 2-7 [T10N0].>

O: DTC P0133 — FRONT OXYGEN SENSOR CIRCUIT SLOW RESPONSE —

WIRING DIAGRAM:



NOTE:
Check front oxygen sensor circuit.
<Ref. to 2-7 [T10O0].>

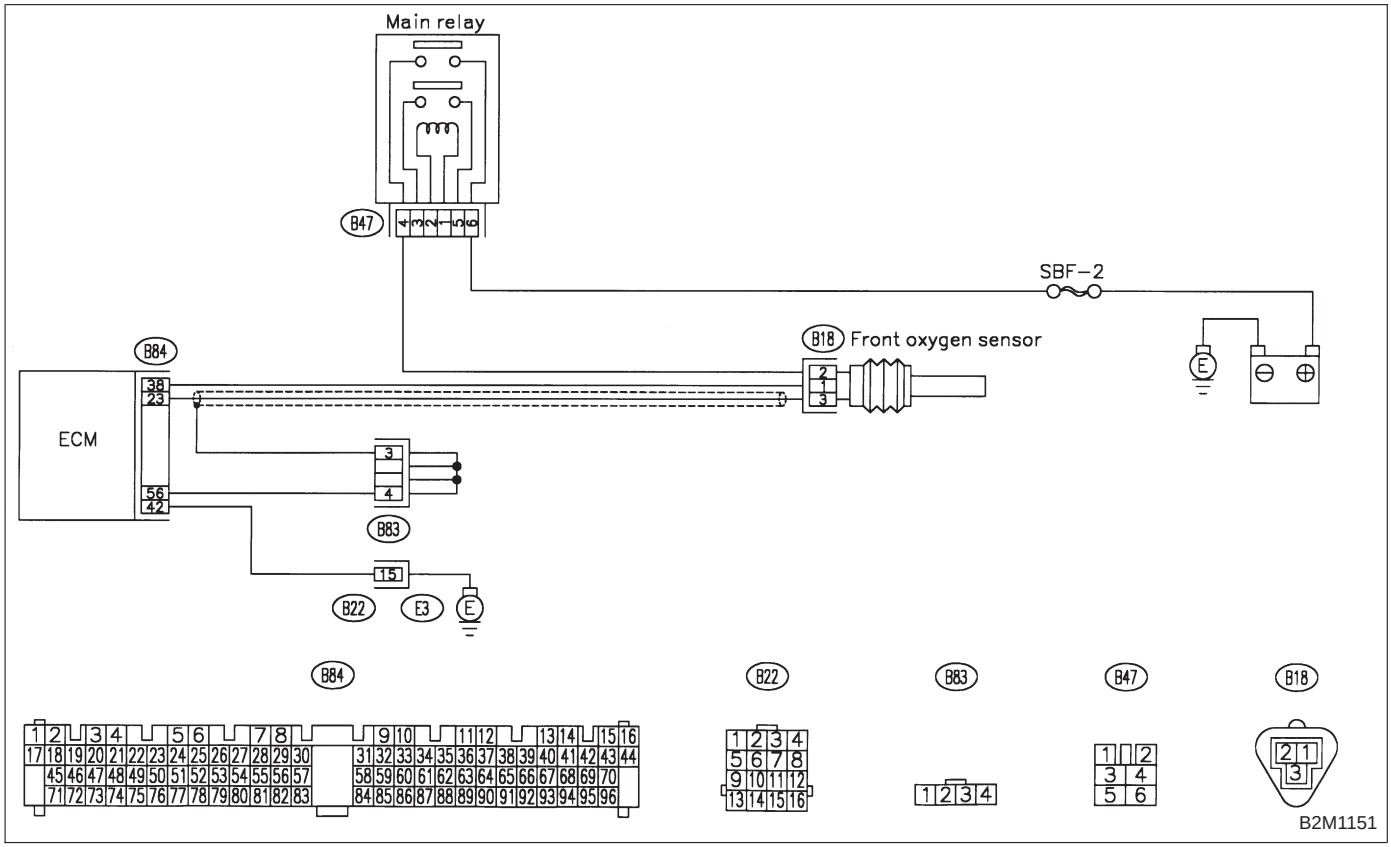
OBD (FB1)

P0135 <FO2H>

OBD0212

P: DTC P0135 — FRONT OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION —

WIRING DIAGRAM:



NOTE:
Check front oxygen sensor heater circuit.
<Ref. to 2-7 [T10P0].>

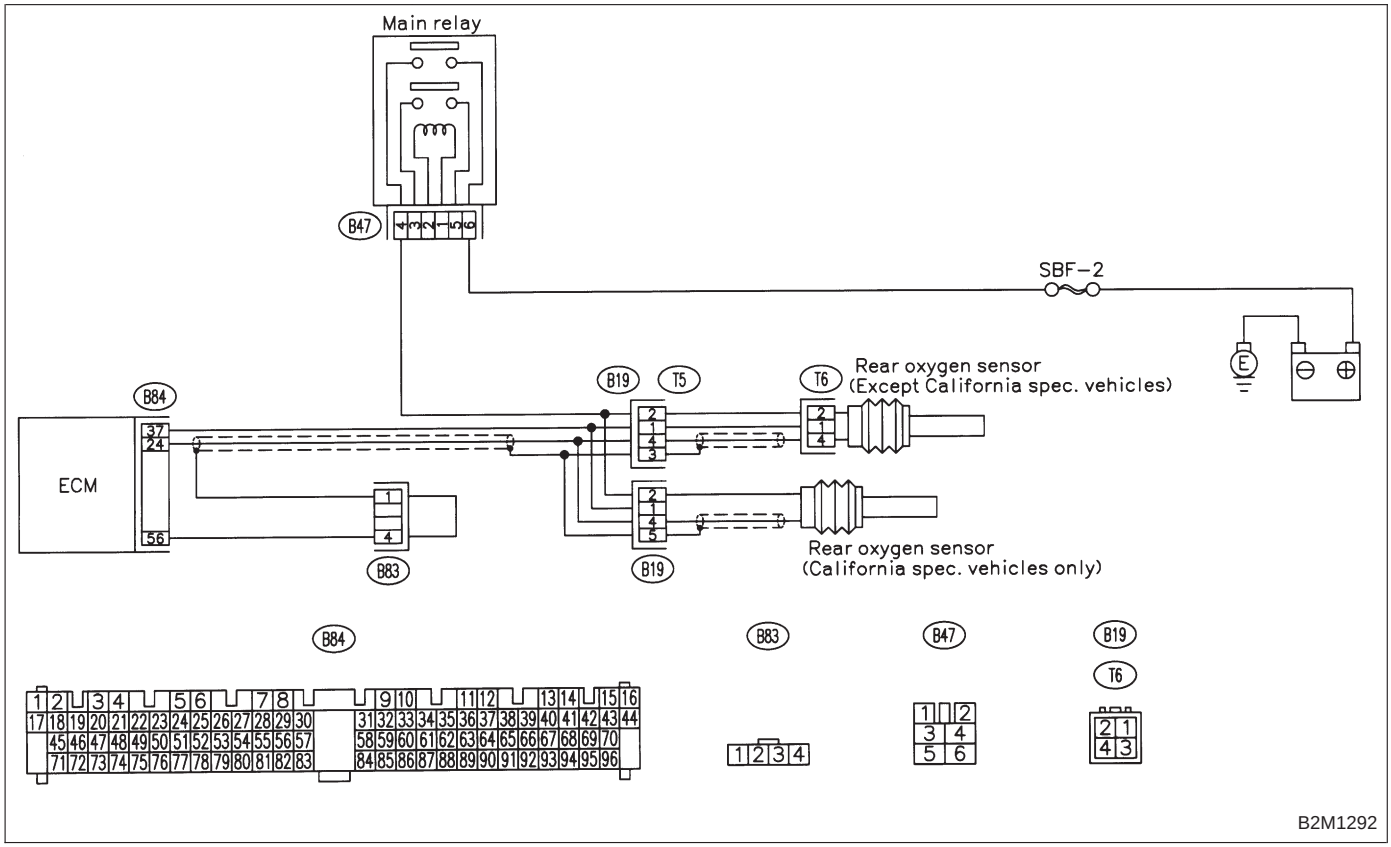
OBD (FB1)

P0136 <RO2_V>

OBD0220

Q: DTC P0136 — REAR OXYGEN SENSOR CIRCUIT MALFUNCTION —

WIRING DIAGRAM:



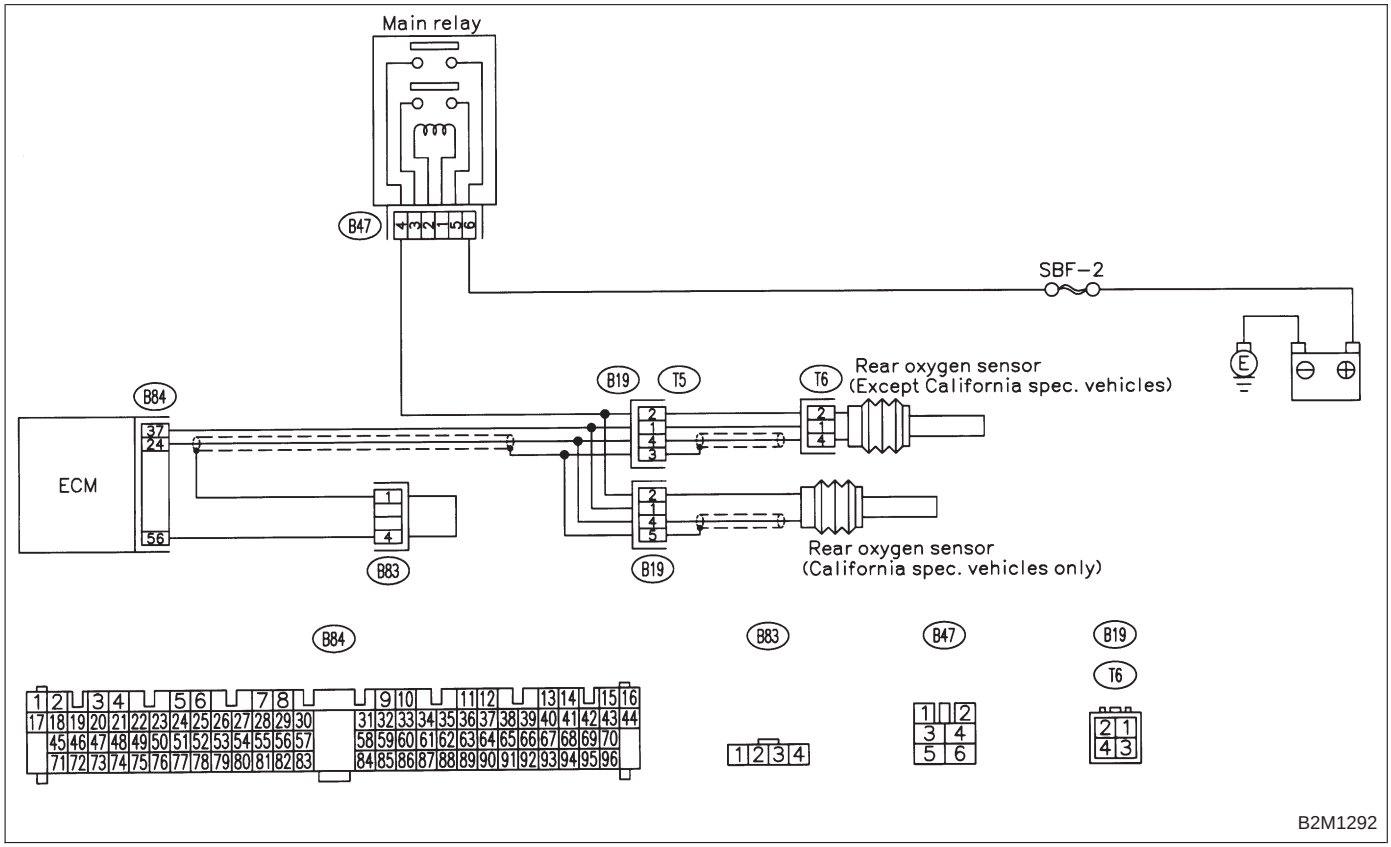
NOTE:
Check rear oxygen sensor circuit.
<Ref. to 2-7 [T10Q0].>

OBD	(FB1)
P0139	<RO2_R>

OBD0229

R: DTC P0139
— REAR OXYGEN SENSOR CIRCUIT SLOW RESPONSE —

WIRING DIAGRAM:



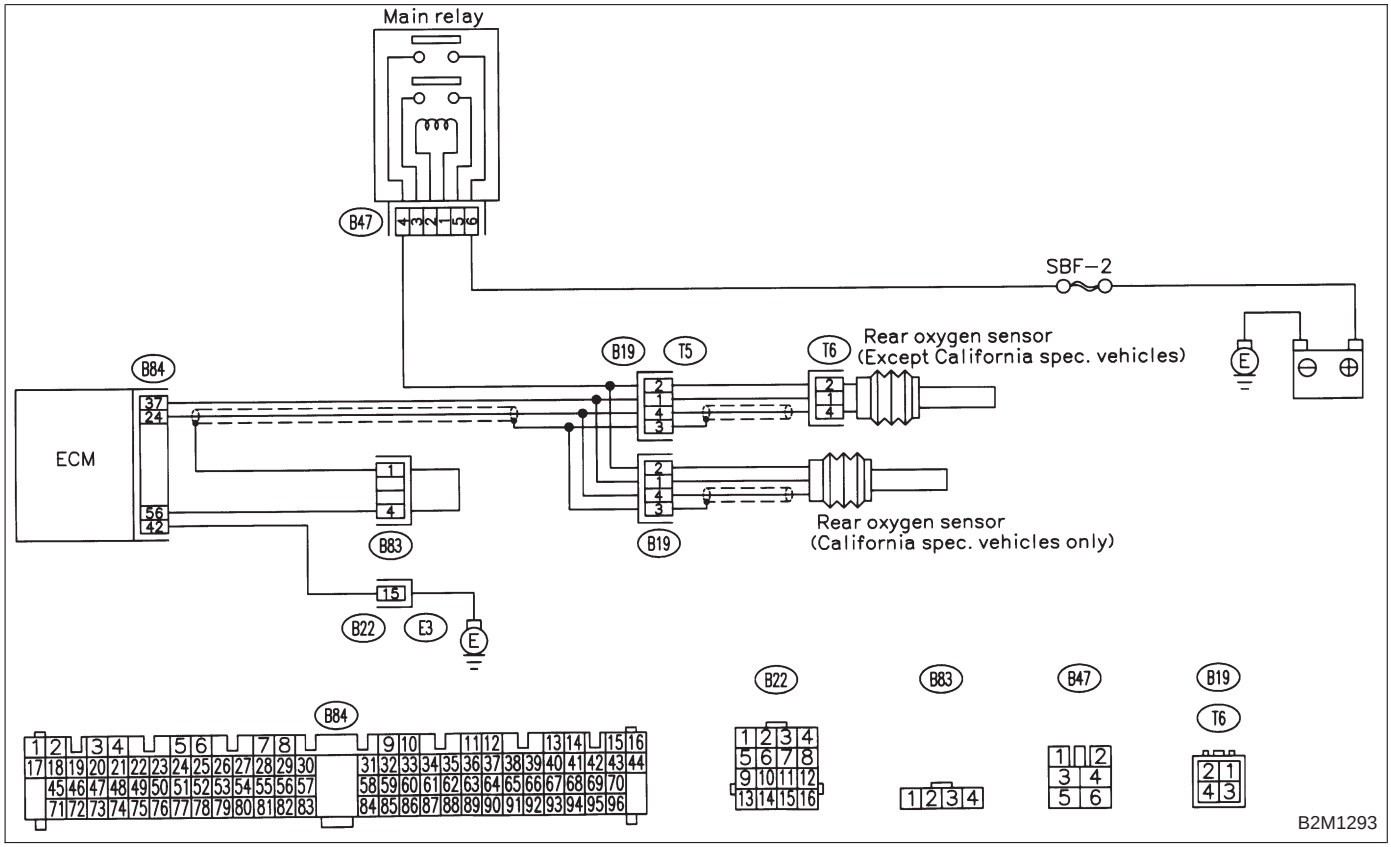
NOTE:
Check rear oxygen sensor circuit.
<Ref. to 2-7 [T10R0].>

OBD	(FB1)
P0141	<RO2H>

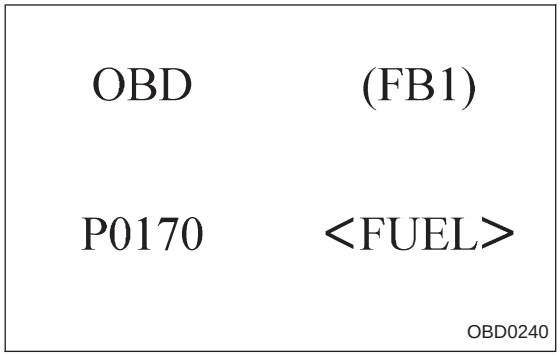
OBD0232

S: DTC P0141 — REAR OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION —

WIRING DIAGRAM:



NOTE:
Check rear oxygen sensor heater circuit.
<Ref. to 2-7 [T10S0].>



T: DTC P0170
— FUEL TRIM MALFUNCTION —

NOTE:
Check fuel trim control system.
<Ref. to 2-7 [T10T0].>

OBD (FB1)

P0181 <TNKT_F>

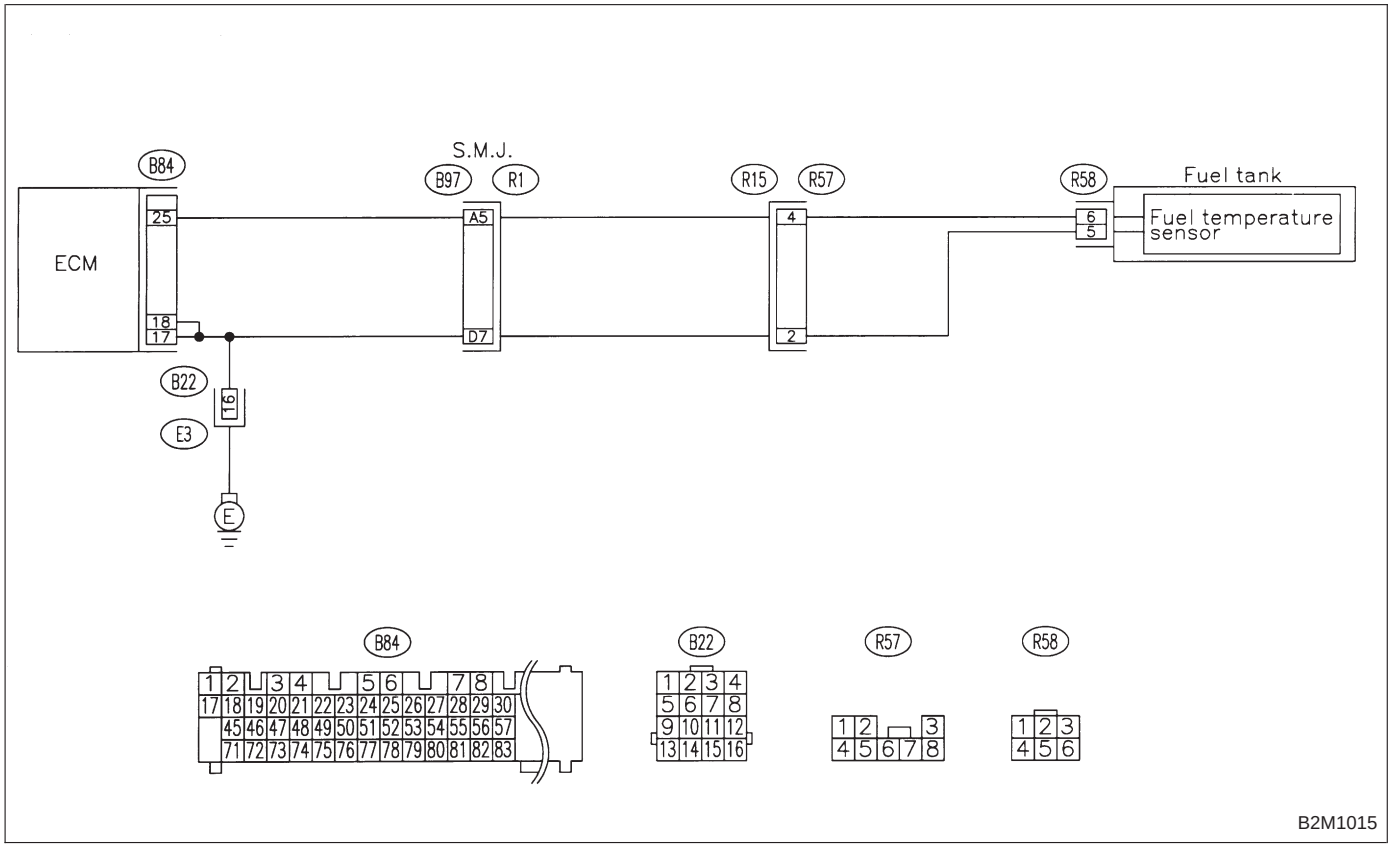
H2M1350

U: DTC P0181 — FUEL TEMPERATURE SENSOR A CIRCUIT RANGE/PERFORMANCE PROBLEM —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



B2M1015

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

11U1	**CHECK DTC P0182 OR P0183 ON DISPLAY.**

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0182 or P0183?***

YES : Inspect DTC P0182 or P0183 using “11. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T11A0].>

NOTE:
In this case, it is not necessary to inspect DTC P0181.

NO : Replace fuel temperature sensor.

OBD (FB1)

P0182 <TNKT_LOW>

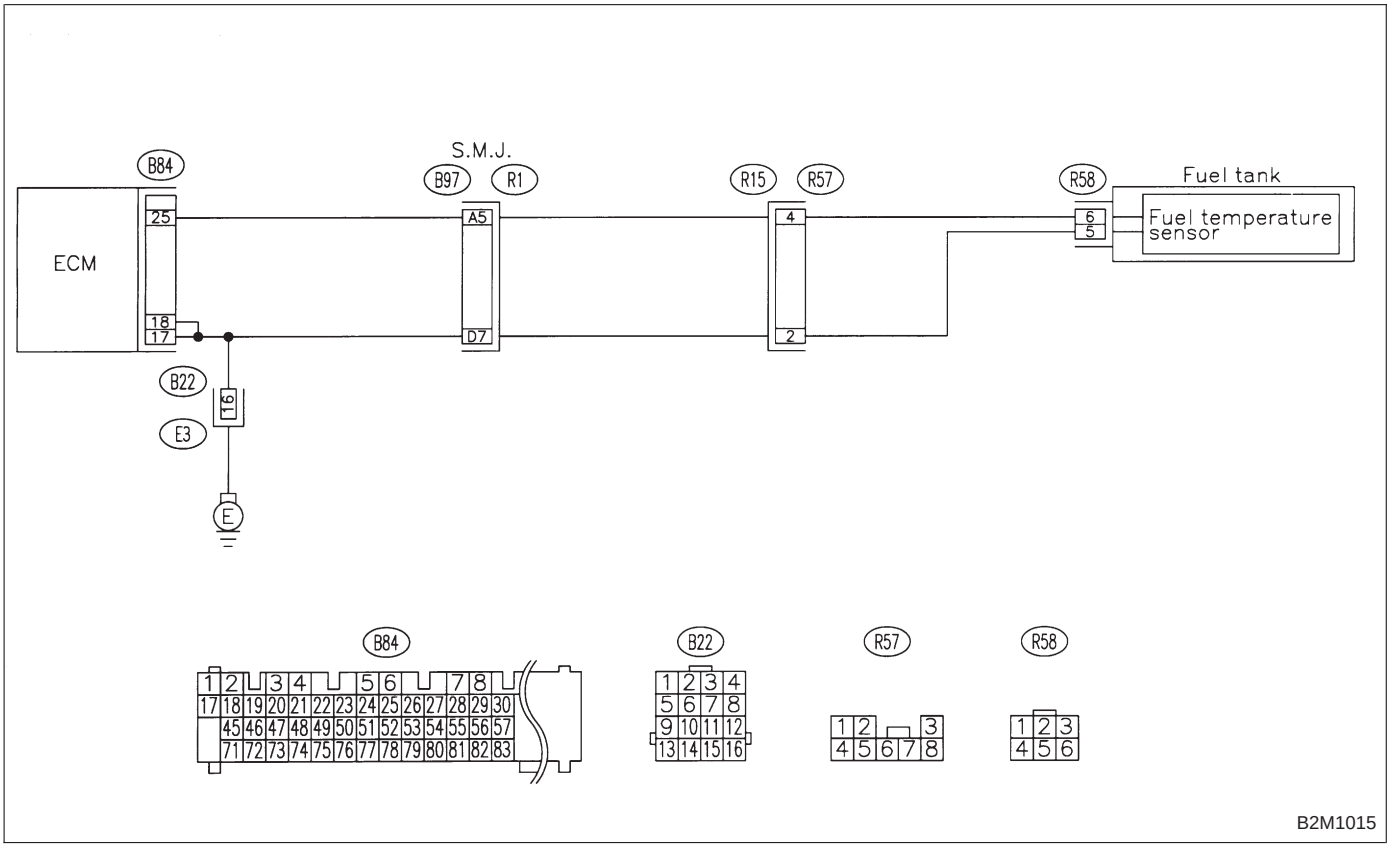
B2M1079

V: DTC P0182 — FUEL TEMPERATURE SENSOR A CIRCUIT LOW INPUT —

DTC DETECTING CONDITION:

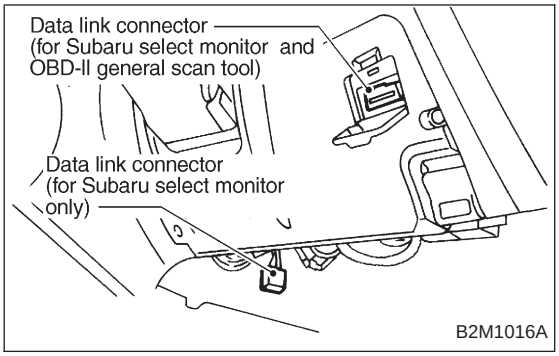
- Immediately at fault recognition

WIRING DIAGRAM:



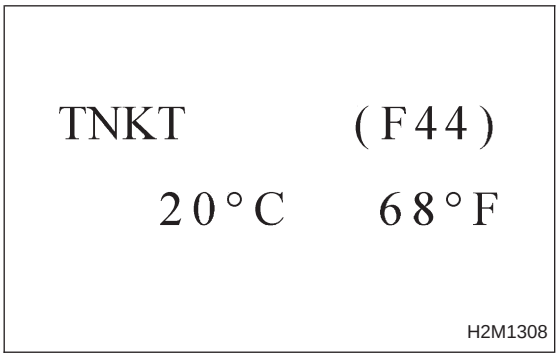
B2M1015

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



11V1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
4) Start engine.



5) Read data on Subaru Select Monitor or OBD-II general scan tool.

● Subaru Select Monitor
Designate mode using function key.

Function mode: F44

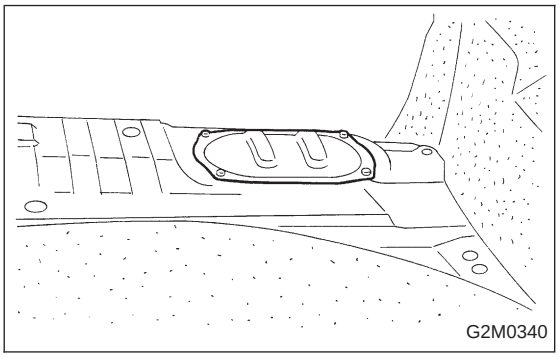
● F44: Fuel temperature is indicated in "°C" and "°F".

CHECK ***: Is the value greater than 150°C or 300°F in function mode F44?***

YES : Go to step **11V2**.

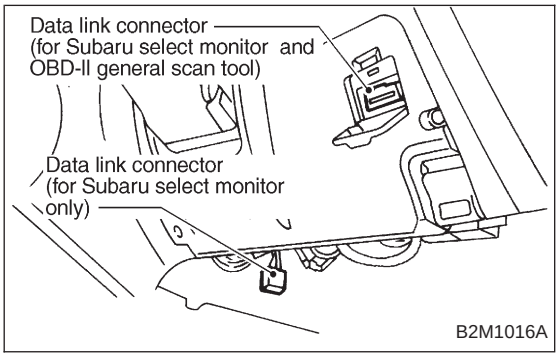
NO : Even if MIL lights up, the circuit has returned to a normal condition at this time.

● OBD-II general scan tool
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

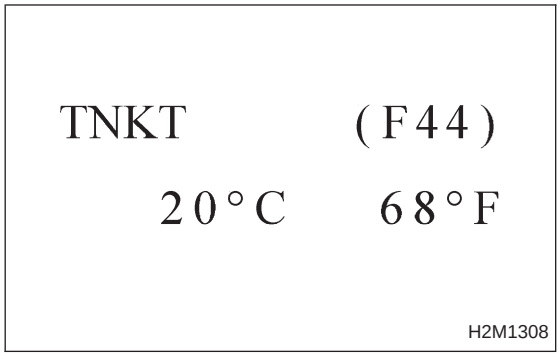


11V2	CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Remove access hole lid.
3) Disconnect connector from fuel pump.



4) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
5) Turn ignition switch and Subaru Select Monitor or OBD-II general scan tool switch to ON.



6) Read data on Subaru Select Monitor or the OBD-II general scan tool.

● Subaru Select Monitor

Designate mode using function key.

Function mode: F44

● F44: Fuel temperature is indicated in "°C" and "°F".

CHECK ***: Is the value less than −40°C or −40°F in function mode F44?***

YES : Replace fuel temperature sensor.

NO : Repair ground short circuit in harness between fuel pump and ECM connector.

● OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

OBD (FB1)

P0183 <TNKT_HI>

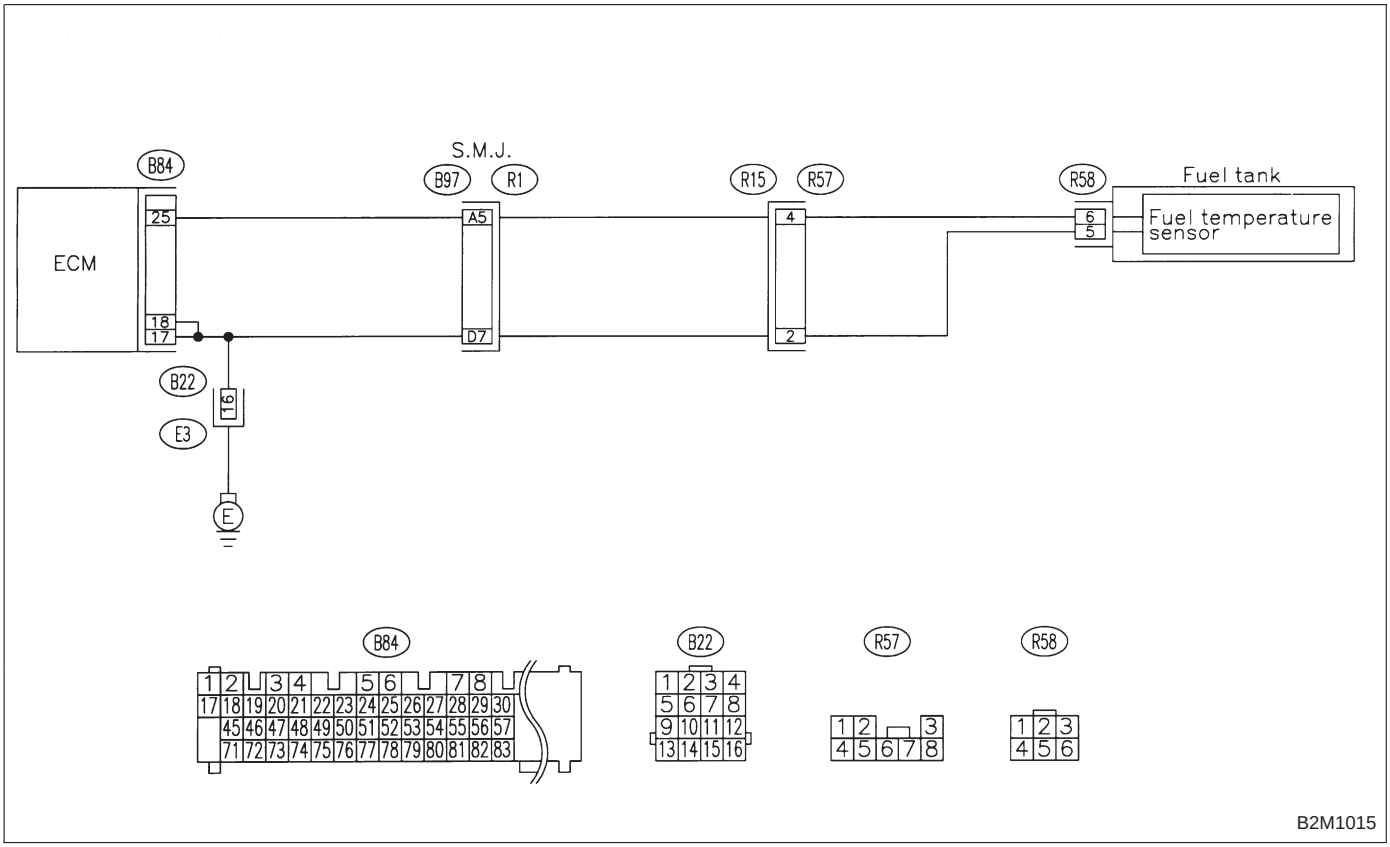
B2M1080

W: DTC P0183 — FUEL TEMPERATURE SENSOR A CIRCUIT HIGH INPUT —

DTC DETECTING CONDITION:

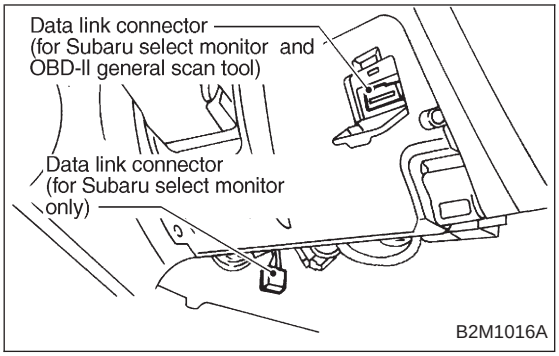
- Immediately at fault recognition

WIRING DIAGRAM:



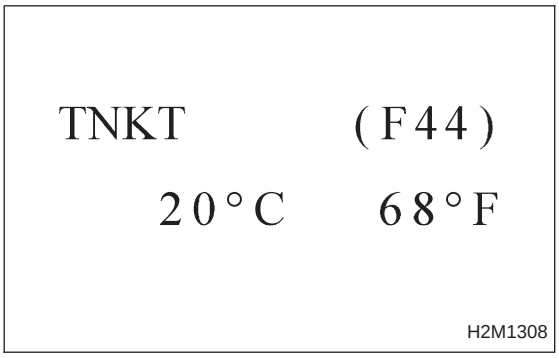
B2M1015

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



11W1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
4) Start engine.



5) Read data on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor

Designate mode using function key.

Function mode: F44

- F44: Fuel temperature is indicated in "°C" and "°F".

CHECK ***: Is the value less than −40°C or −40°F in function mode F44?***

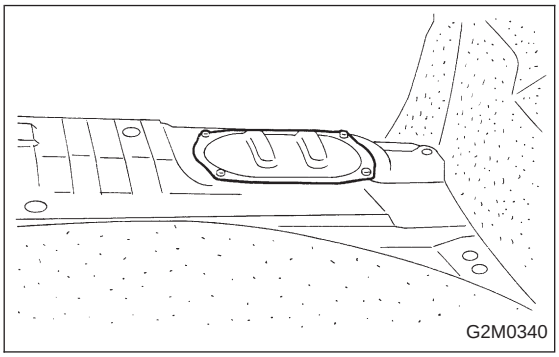
YES : Go to step **11W2**.

NO : Repair poor contact.

NOTE:
In this case, repair the following:

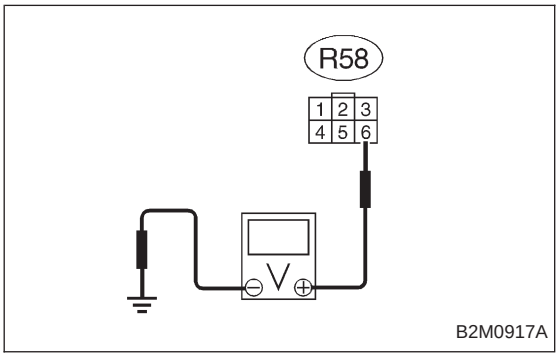
- Poor contact in fuel pump connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B22, B97 and R57)
- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



11W2	CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Remove access hole lid.
3) Disconnect connector from fuel pump.

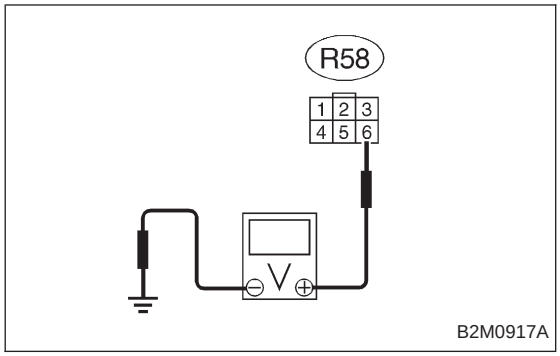


4) Measure voltage between fuel pump connector and chassis ground.

CHECK ***: Connector & terminal (R58) No. 6 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and fuel pump connector.

NO : Go to next step 5).

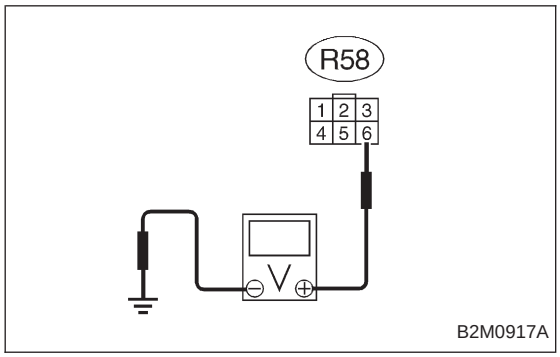


5) Turn ignition switch to ON.
6) Measure voltage between fuel pump connector and chassis ground.

CHECK : ***Connector & terminal (R58) No. 6 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and fuel pump connector.

NO : Go to step **11W3**.



11W3	CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.

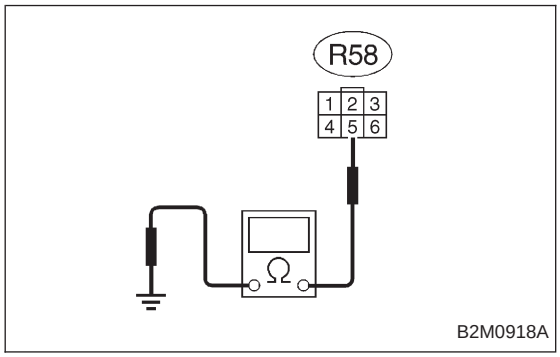
1) Measure voltage between fuel pump connector and chassis ground.

CHECK : ***Connector & terminal (R58) No. 6 (+) — Chassis ground (−): Is the voltage more than 4 V?***

YES : Go to next step 2).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and fuel pump connector
- Poor contact in fuel pump connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (B97 and R57)



2) Turn ignition switch to OFF.
3) Measure resistance of harness between fuel pump connector and chassis ground.

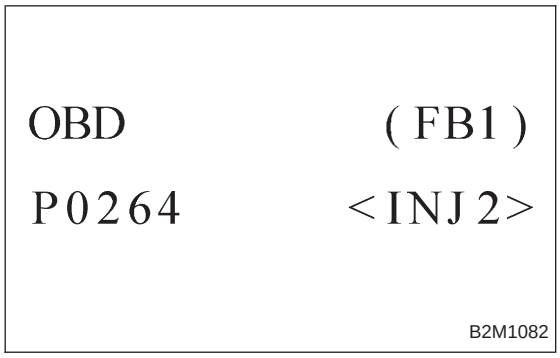
CHECK : ***Connector & terminal (R58) No. 5 — Chassis ground: Is the resistance less than 5 Ω?***

YES : Replace fuel temperature sensor.

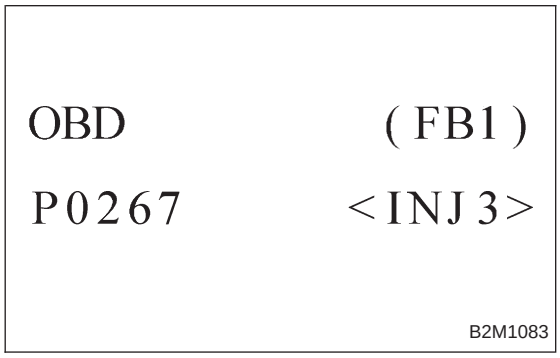
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and fuel pump connector
- Poor contact in fuel pump connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (B22, B97 and R57)

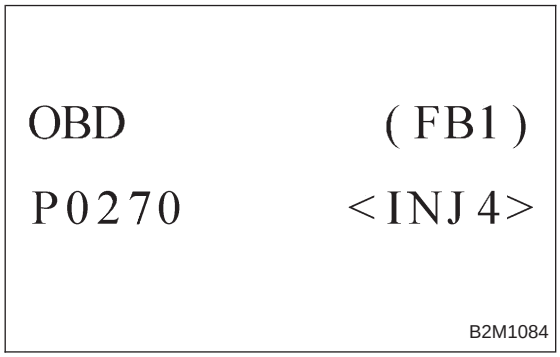
X: DTC P0261
— FUEL INJECTOR CIRCUIT LOW INPUT - #1 —



Y: DTC P0264
— FUEL INJECTOR CIRCUIT LOW INPUT - #2 —

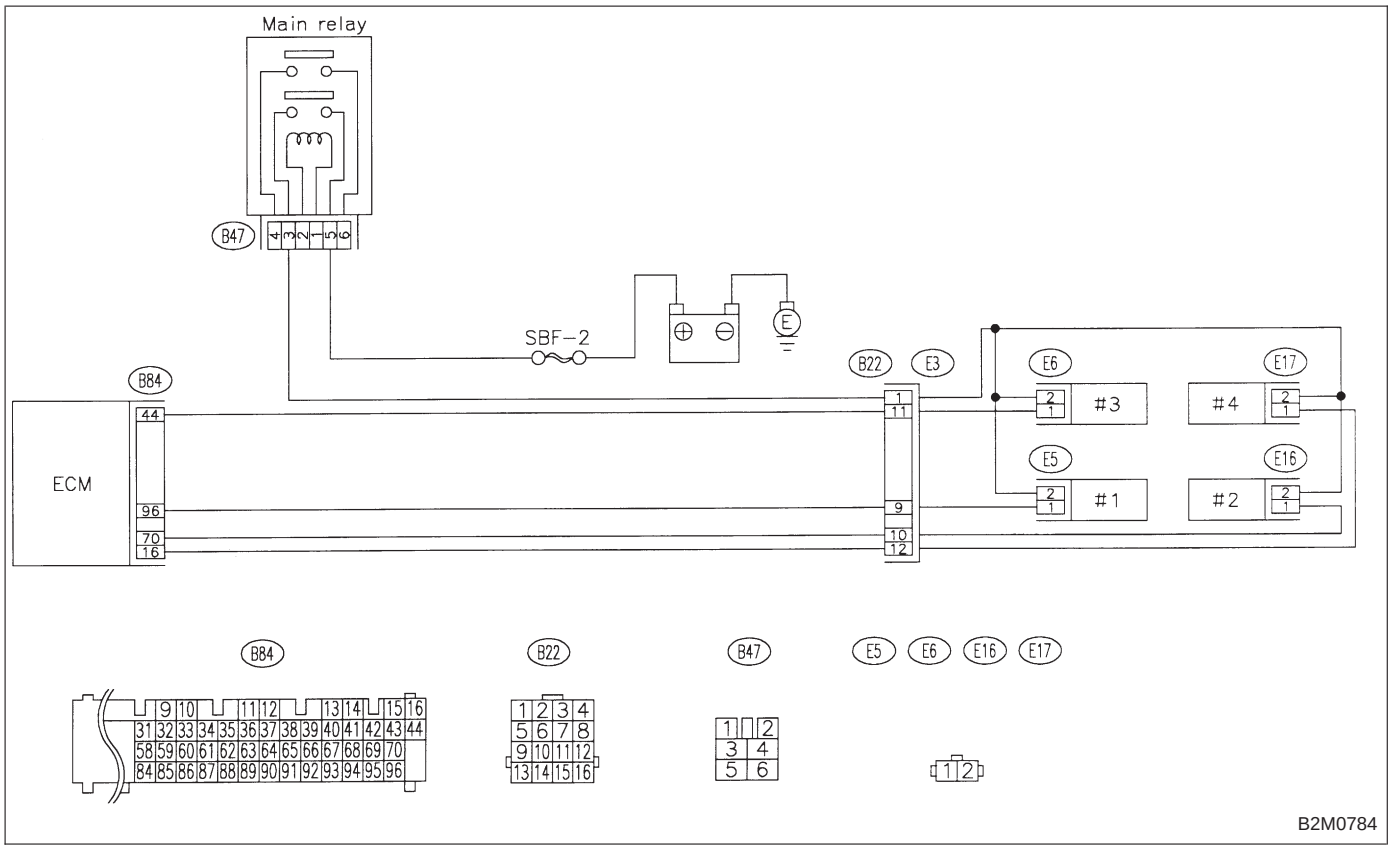


Z: DTC P0267
— FUEL INJECTOR CIRCUIT LOW INPUT - #3 —

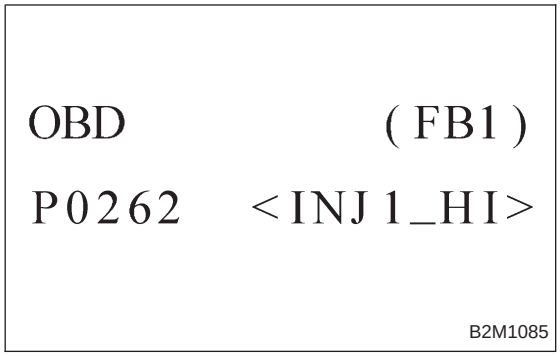


AA: DTC P0270
— FUEL INJECTOR CIRCUIT LOW INPUT - #4 —

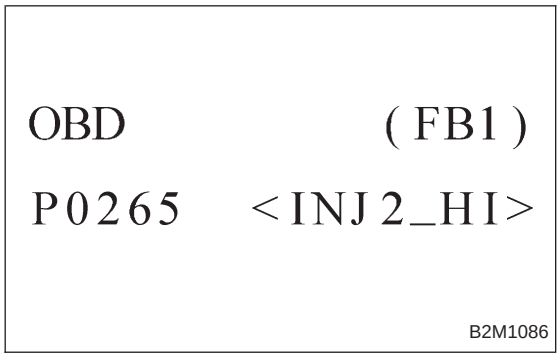
WIRING DIAGRAM:



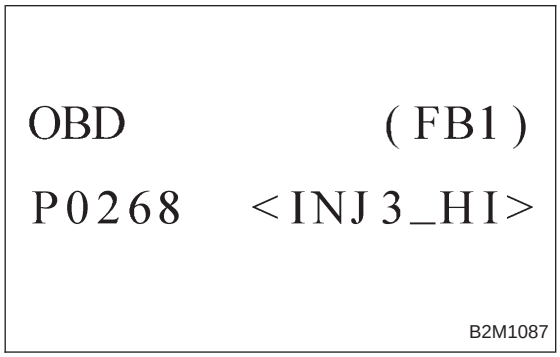
NOTE:
Check fuel injector circuit.
<Ref. to 2-7 [T10X0].>



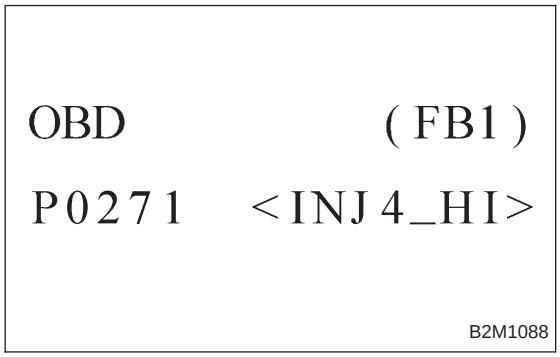
AB: DTC P0262
— FUEL INJECTOR CIRCUIT HIGH INPUT - #1 —



AC: DTC P0265
— FUEL INJECTOR CIRCUIT HIGH INPUT - #2 —

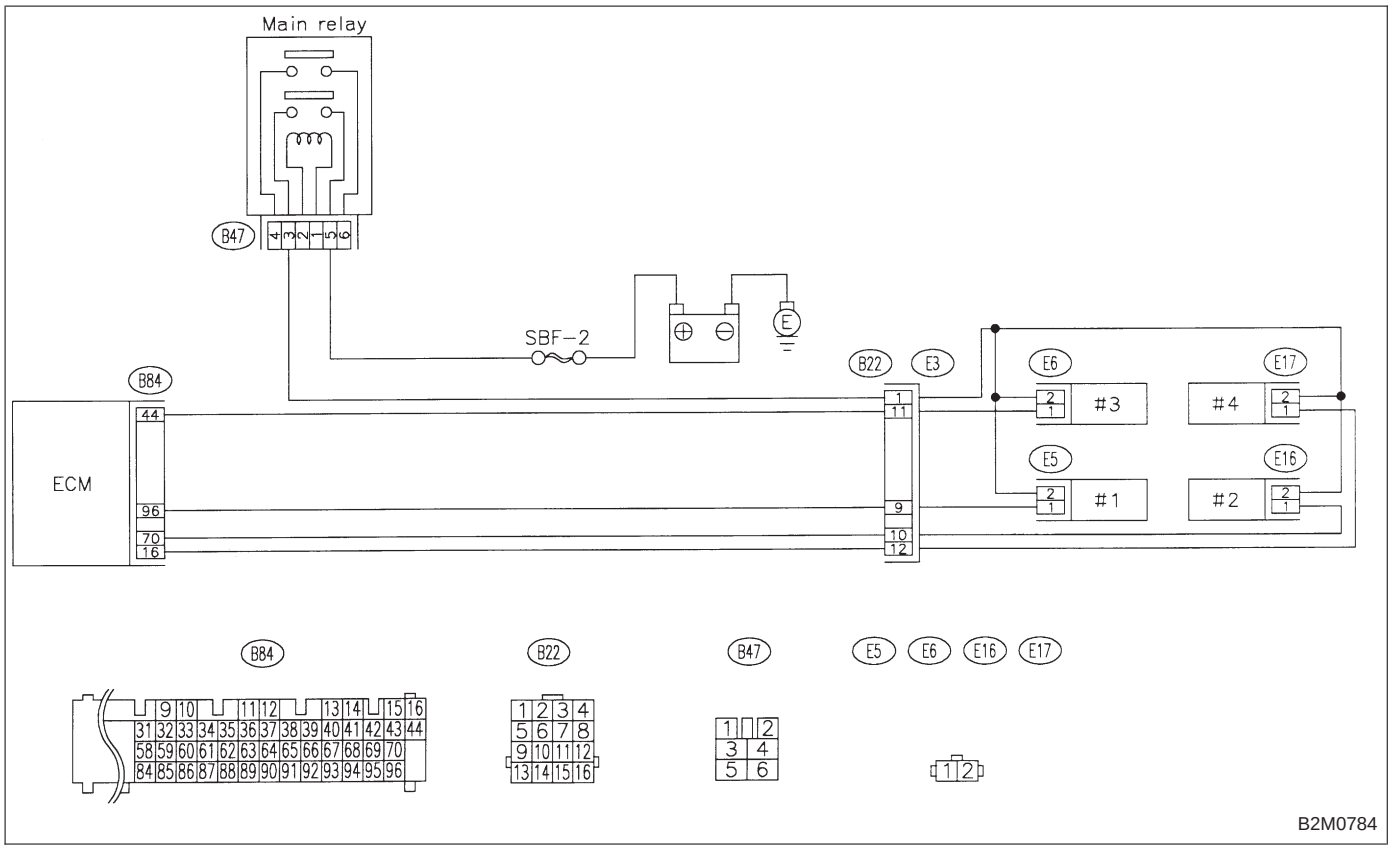


AD: DTC P0268
— FUEL INJECTOR CIRCUIT HIGH INPUT - #3 —



AE: DTC P0271
— FUEL INJECTOR CIRCUIT HIGH INPUT - #4 —

WIRING DIAGRAM:



NOTE:
Check fuel injector circuit.
<Ref. to 2-7 [T10AB0].>

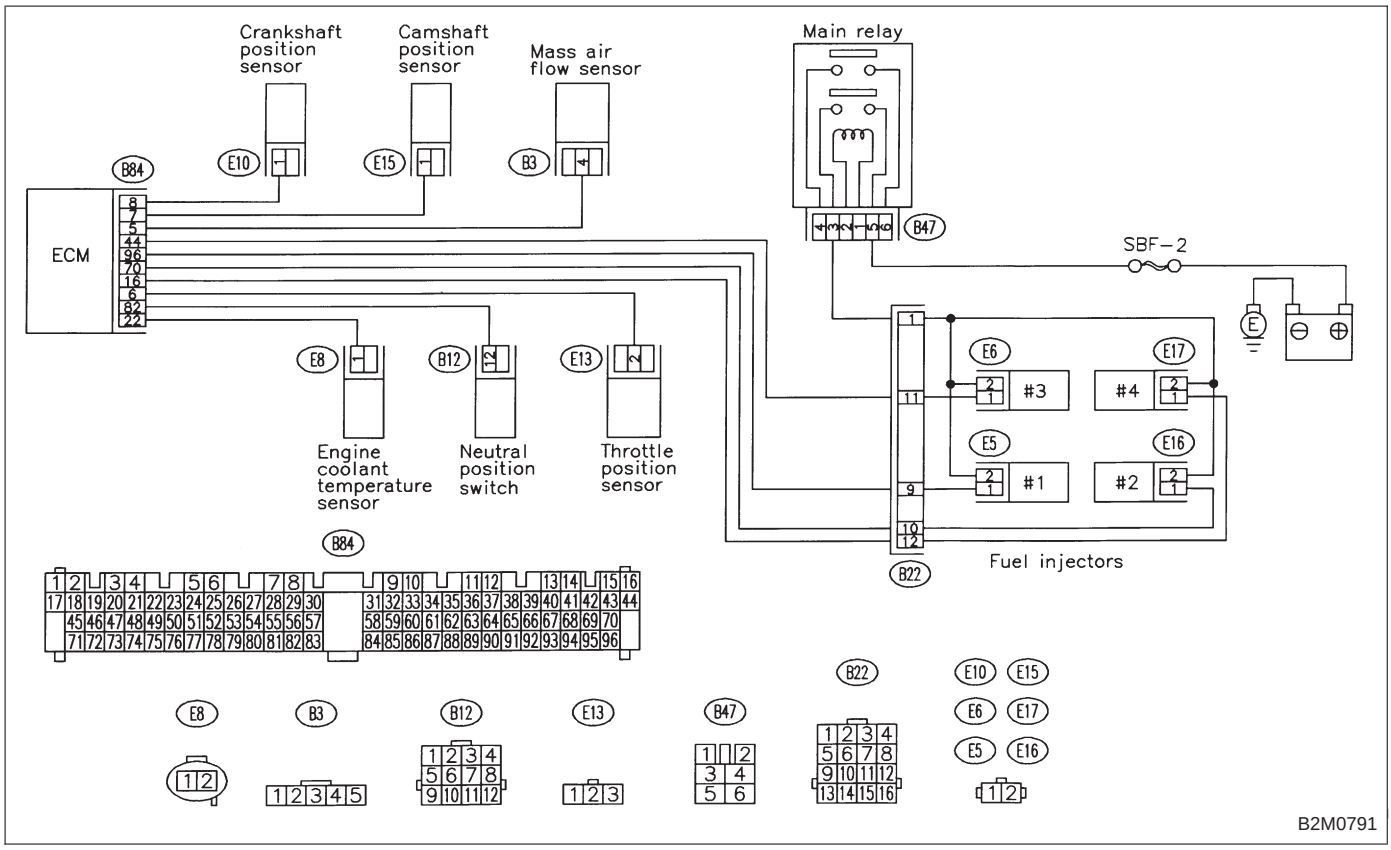
AF: DTC P0301
— CYLINDER 1 MISFIRE DETECTED —

AG: DTC P0302
— CYLINDER 2 MISFIRE DETECTED —

AH: DTC P0303
— CYLINDER 3 MISFIRE DETECTED —

AI: DTC P0304
— CYLINDER 4 MISFIRE DETECTED —

WIRING DIAGRAM:



NOTE:
Check fuel injection control system.
<Ref. to 2-7 [T10AF0].>

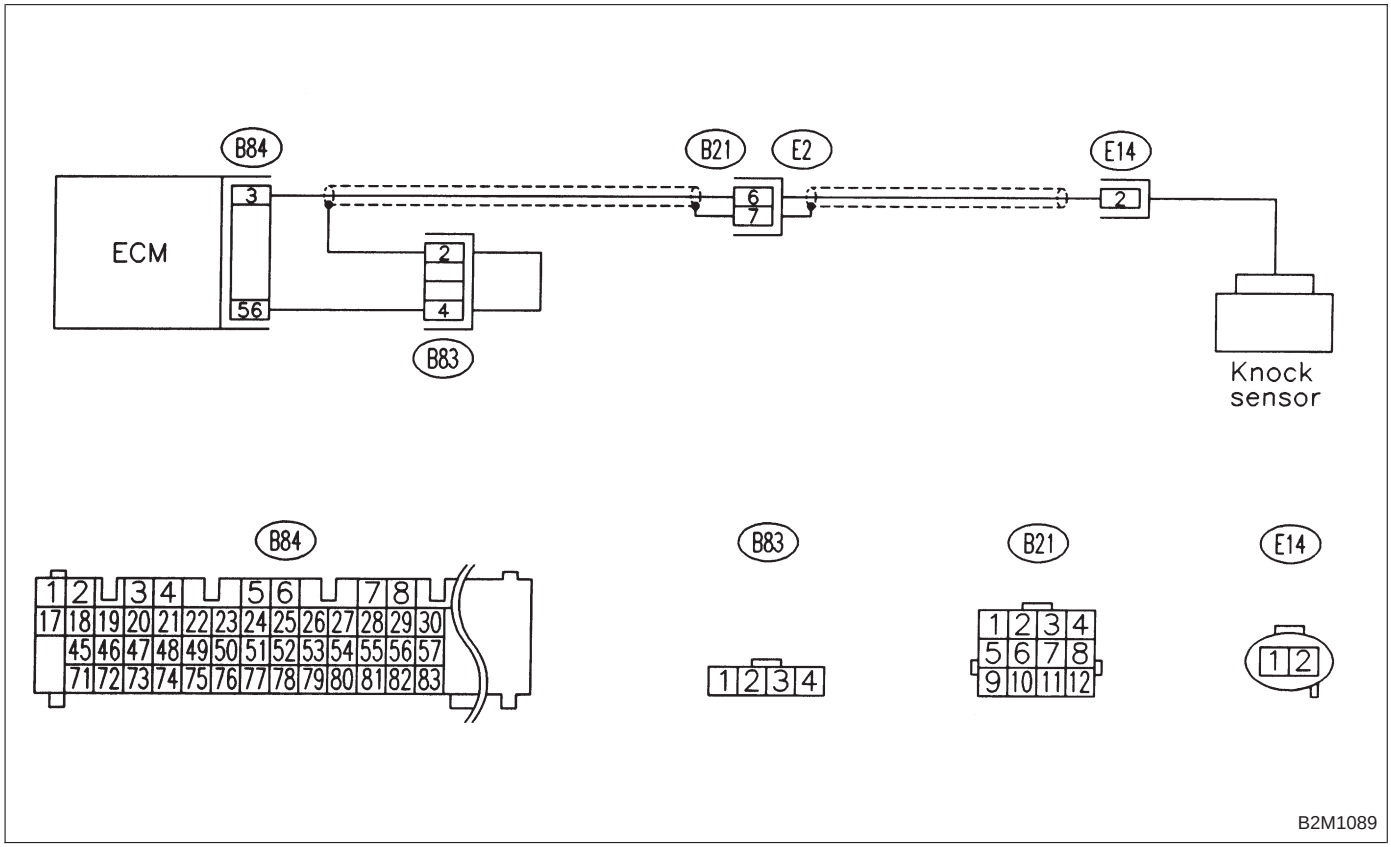
OBD (FB1)

P0325 <KNOCK>

OBD0283

AJ: DTC P0325 — KNOCK SENSOR CIRCUIT MALFUNCTION —

WIRING DIAGRAM:



NOTE:
Check knock sensor circuit.
<Ref. to 2-7 [T10AJ0].>

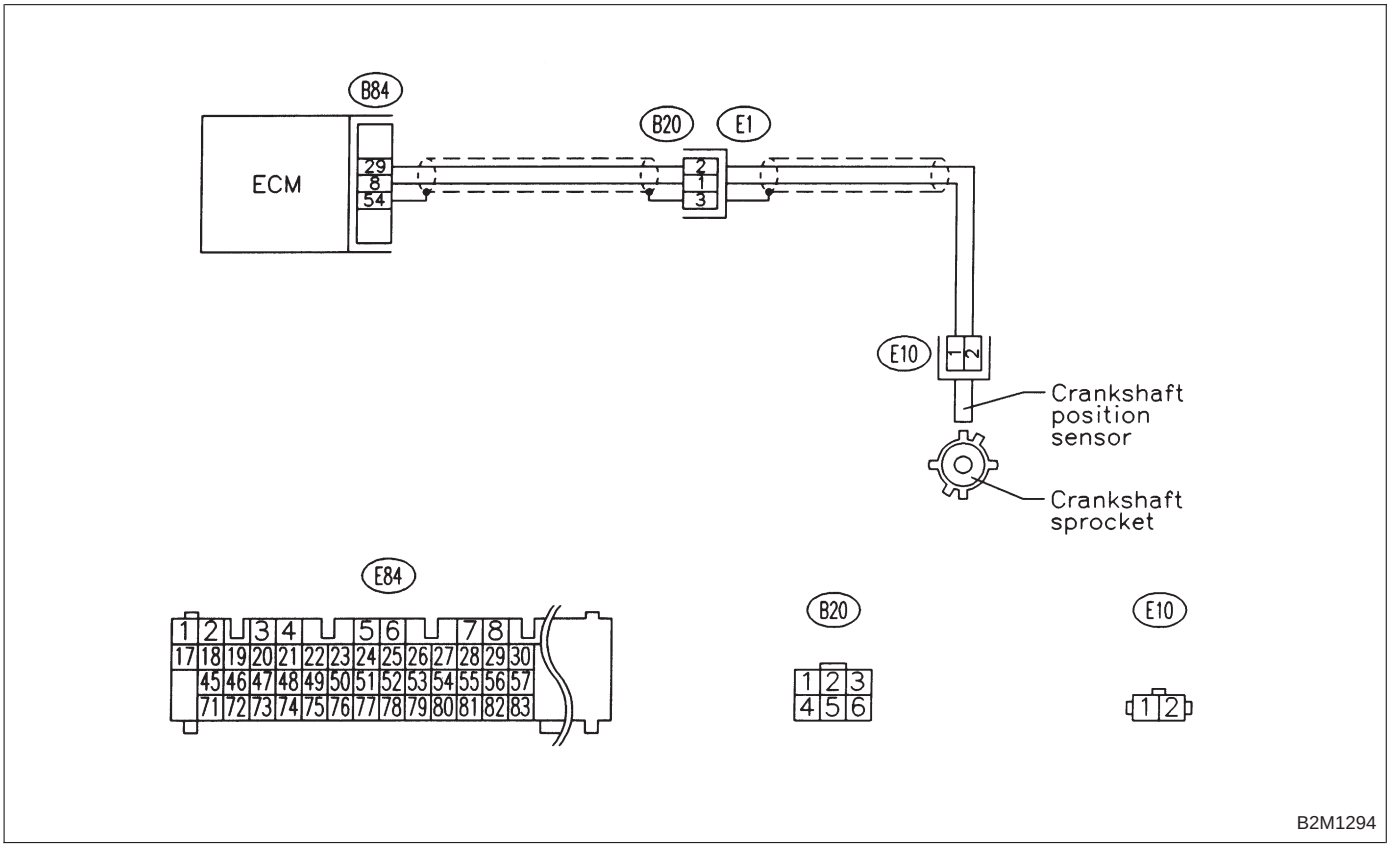
OBD (FB1)

P0335 <CRANK>

OBD0292

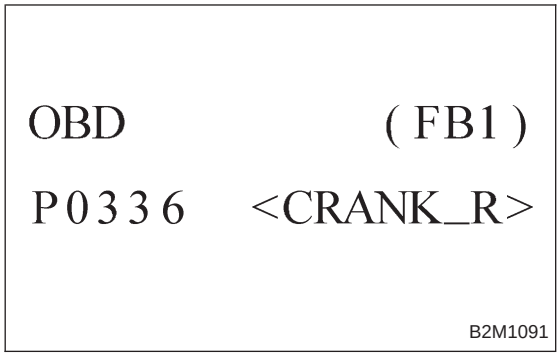
AK: DTC P0335 — CRANKSHAFT POSITION SENSOR CIRCUIT MALFUNCTION —

WIRING DIAGRAM:



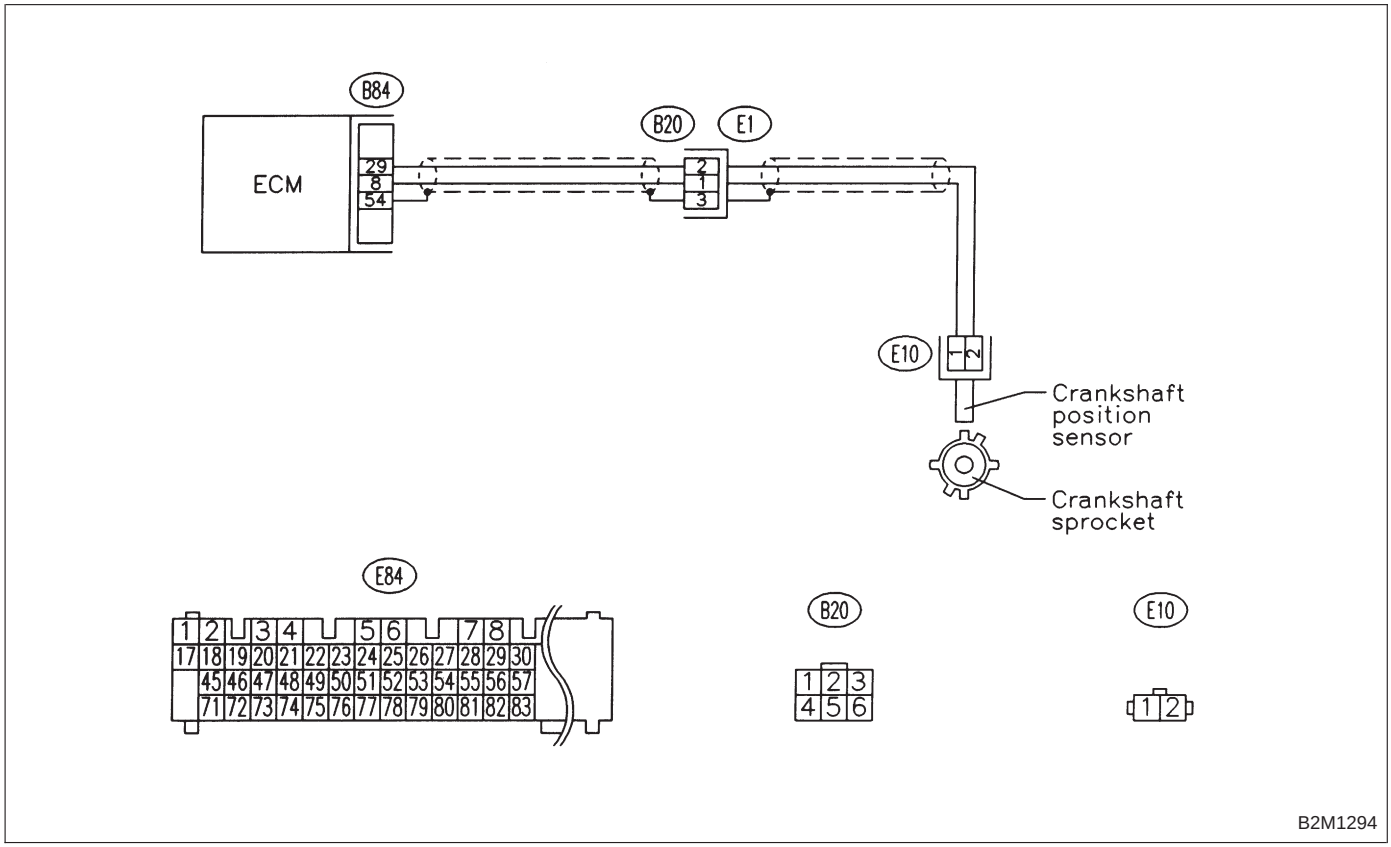
B2M1294

NOTE:
Check crankshaft position sensor circuit.
<Ref. to 2-7 [T10AK0].>



AL: DTC P0336 — CRANKSHAFT POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —

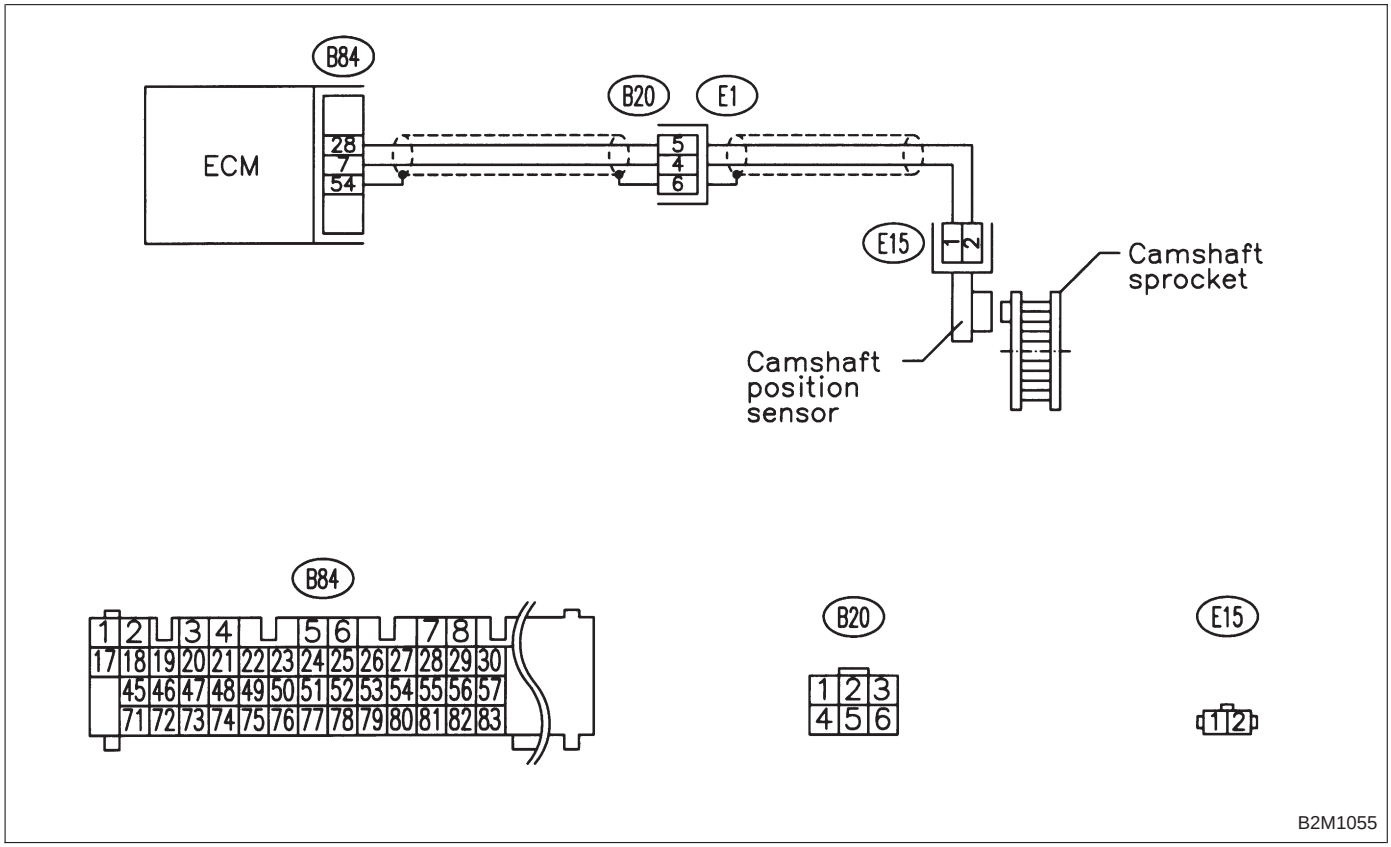
WIRING DIAGRAM:



NOTE:
Check crankshaft position sensor circuit.
<Ref. to 2-7 [T10AL0].>

AM: DTC P0340 — CAMSHAFT POSITION SENSOR CIRCUIT MALFUNCTION —

WIRING DIAGRAM:

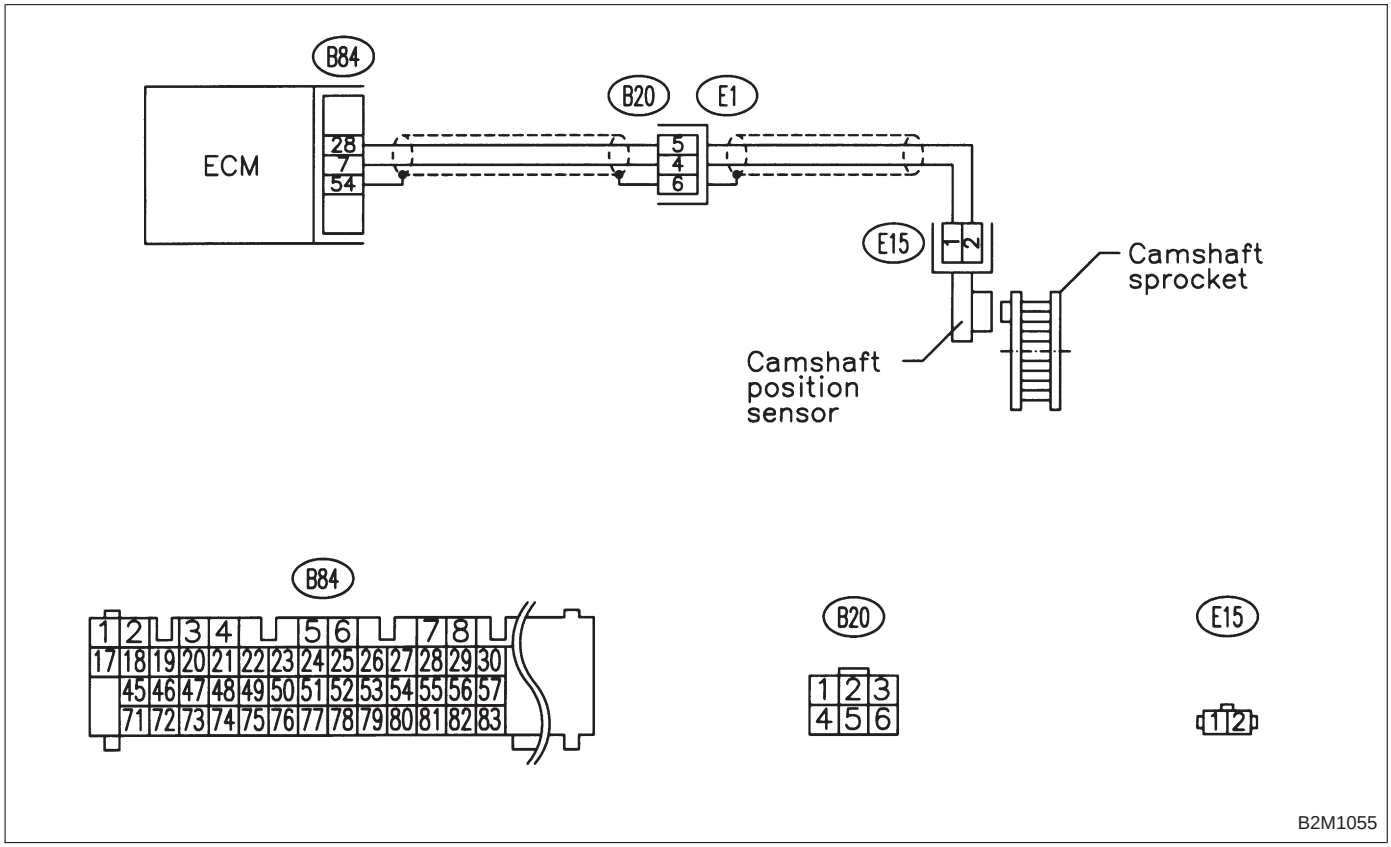


NOTE:
Check camshaft position sensor circuit.
<Ref. to 2-7 [T10AM0].>

OBD (FB1)
P0341 <CAM_R>
B2M1092

AN: DTC P0341 — CAMSHAFT POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —

WIRING DIAGRAM:

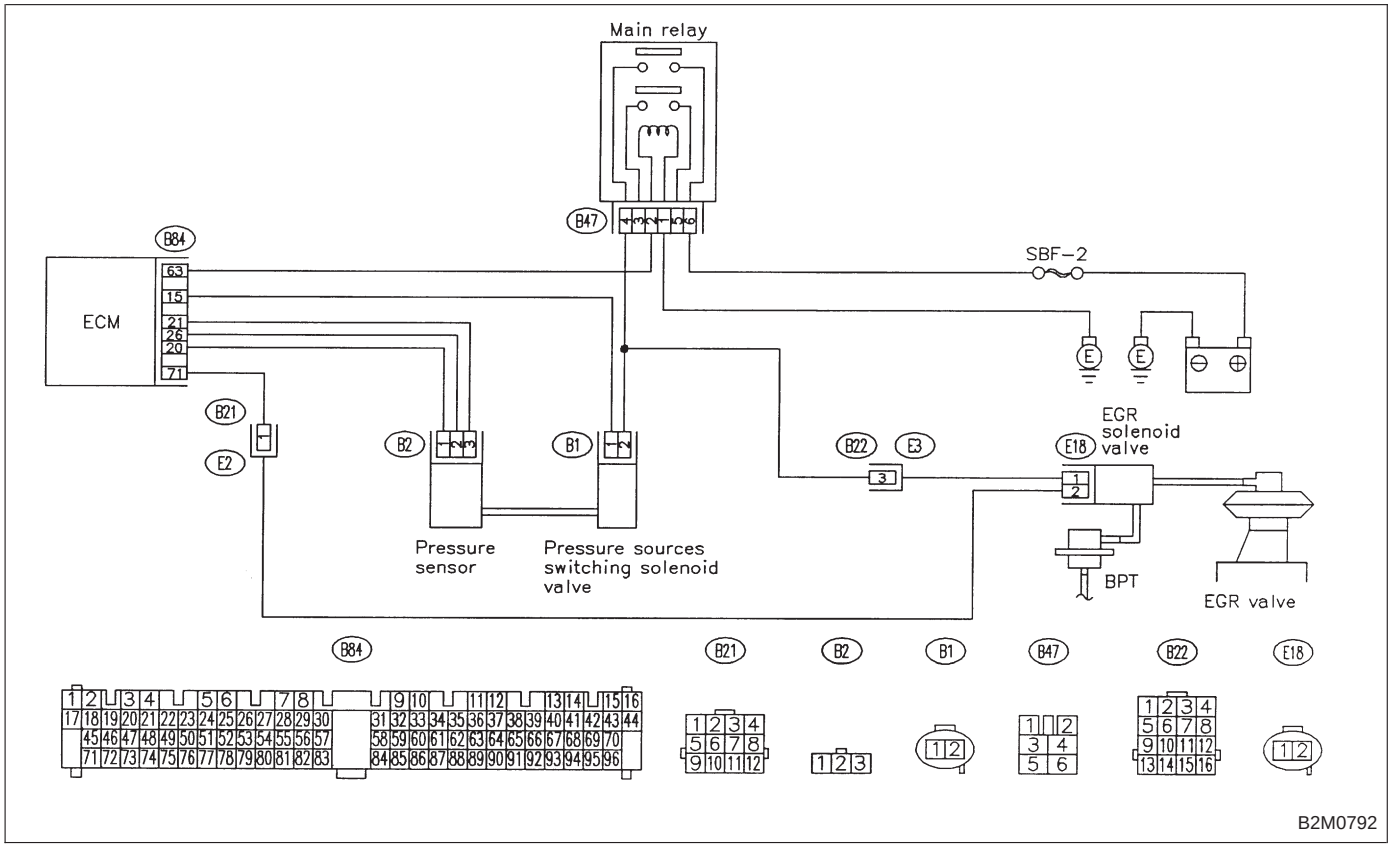


B2M1055

NOTE:
Check camshaft position sensor circuit.
<Ref. to 2-7 [T10AN0].>

AO: DTC P0400 — EXHAUST GAS RECIRCULATION FLOW MALFUNCTION —

WIRING DIAGRAM:



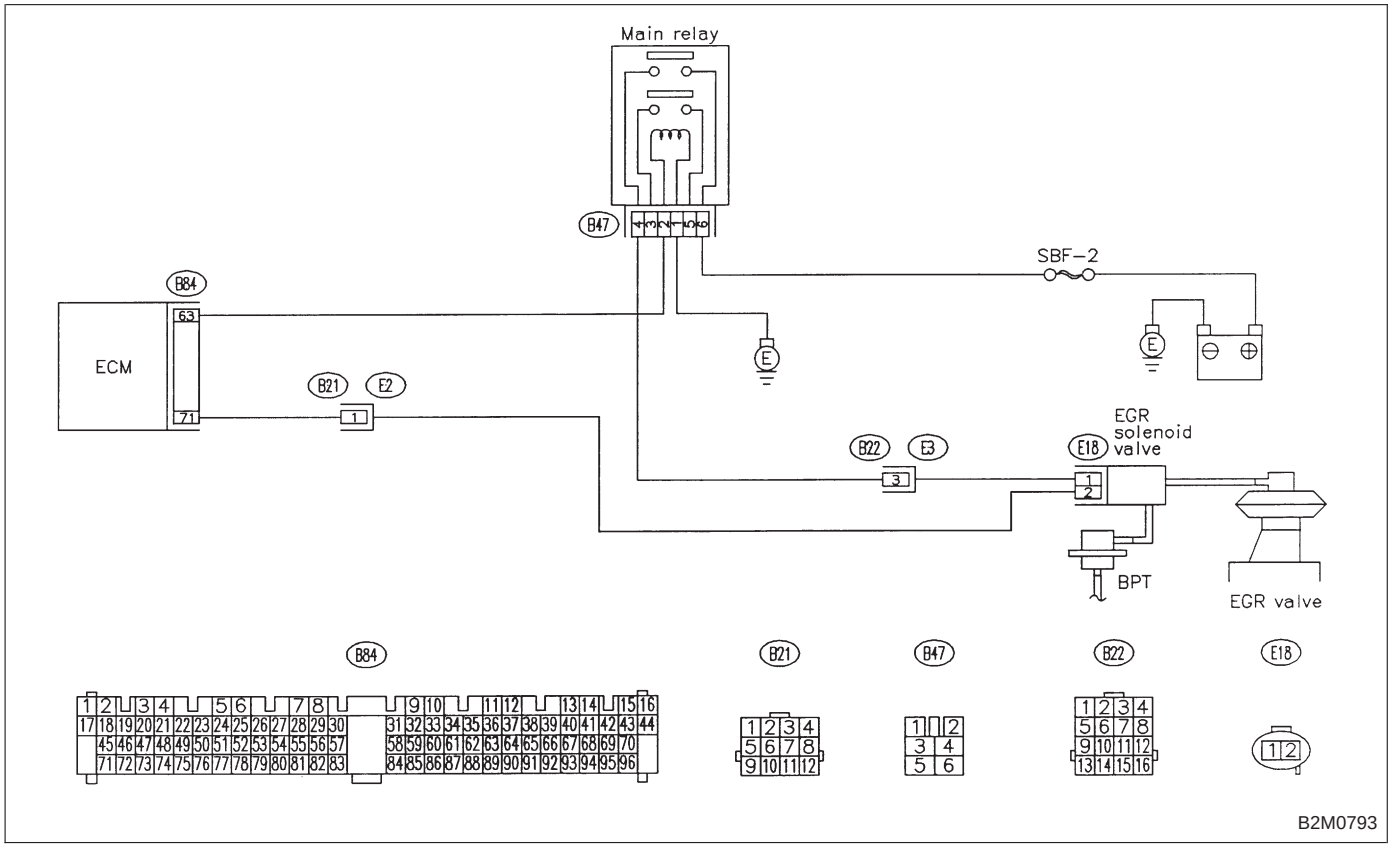
NOTE:
Check exhaust gas recirculation control system.
<Ref. to 2-7 [T10AO0].>

OBD	(FB1)
P0403	<EGRSOL>

OBD0323

AP: DTC P0403 — EXHAUST GAS RECIRCULATION CIRCUIT LOW INPUT —

WIRING DIAGRAM:



B2M0793

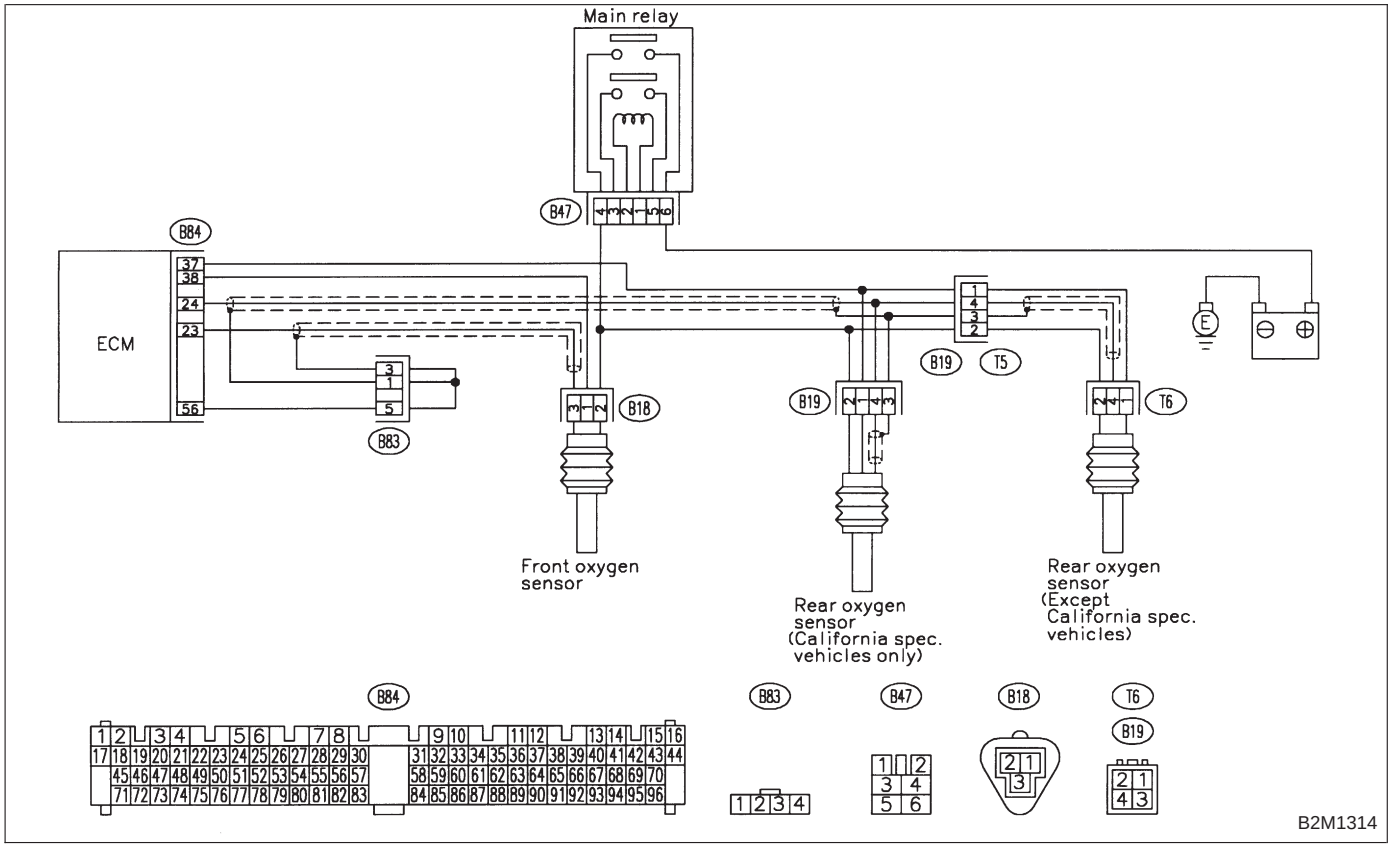
NOTE:
Check exhaust gas recirculation control solenoid valve circuit.
<Ref. to 2-7 [T10AP0].>

OBD	(FB1)
P0420	<CAT>

OBD0329

AQ: DTC P0420 — CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD —

WIRING DIAGRAM:

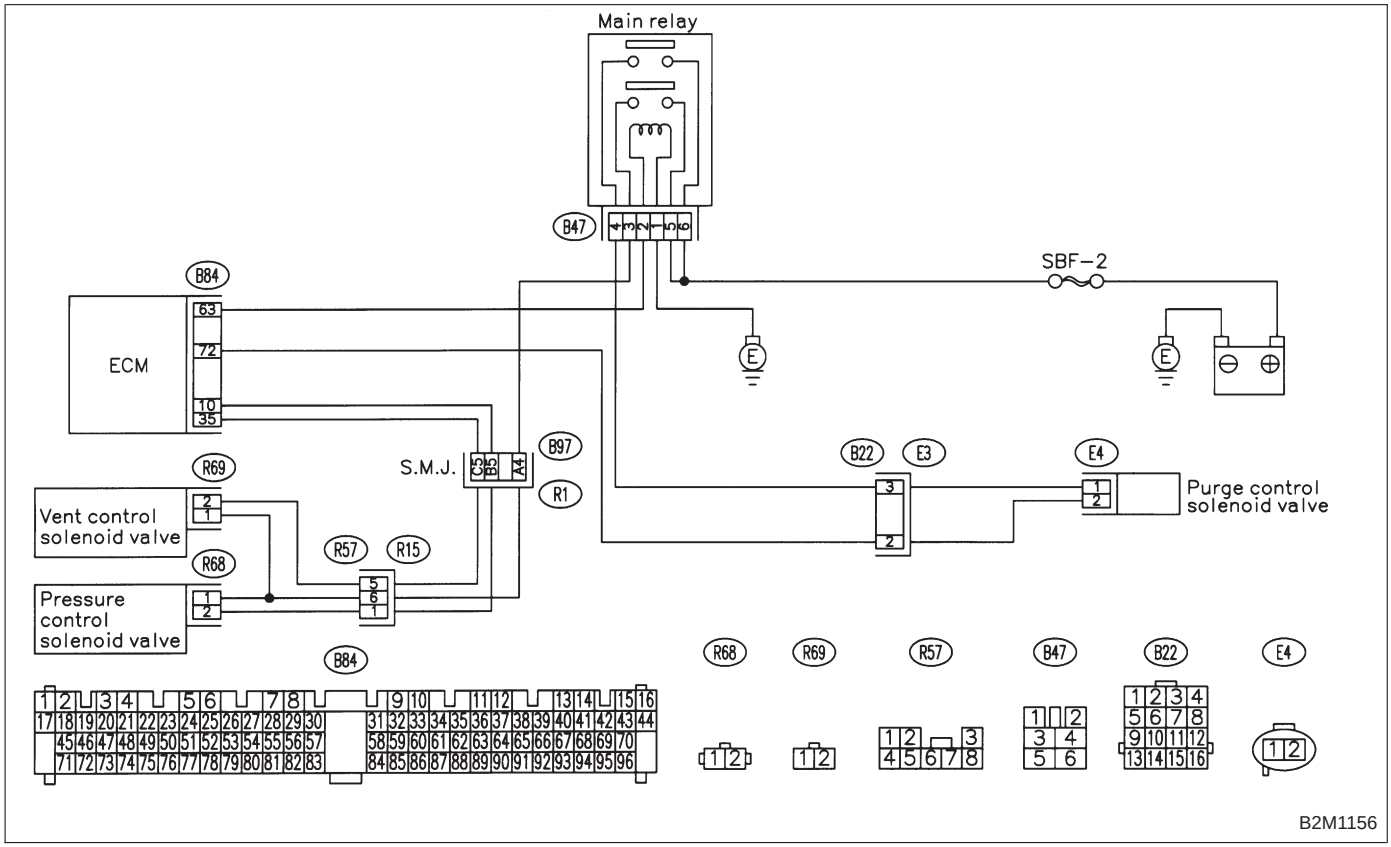


NOTE:
Check catalyst system.
<Ref. to 2-7 [T10AQ0].>

OBD (FB1)
P0440 <EVAP>
H2M1365

AR: DTC P0440 — EVAPORATIVE EMISSION CONTROL SYSTEM MALFUNCTION —

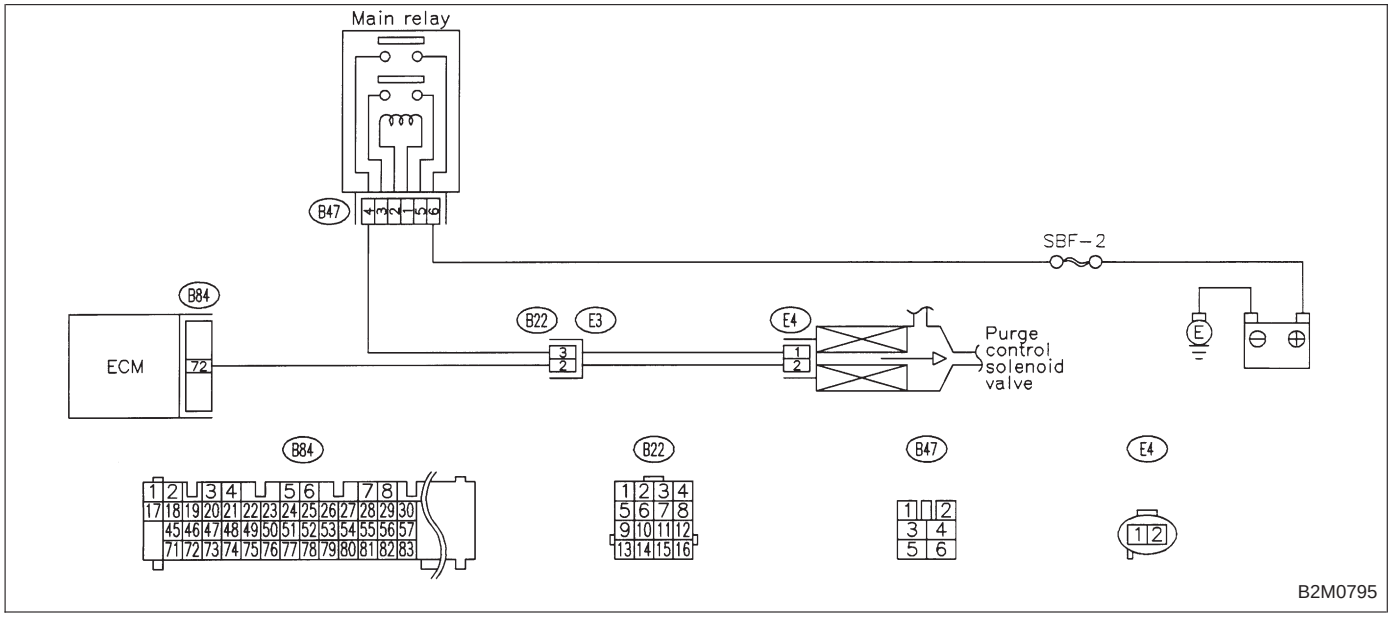
WIRING DIAGRAM:



NOTE:
Check evaporative emission control system.
<Ref. to 2-7 [T10AR0].>

AS: DTC P0441 — EVAPORATIVE EMISSION CONTROL SYSTEM INCORRECT PURGE FLOW —

WIRING DIAGRAM:



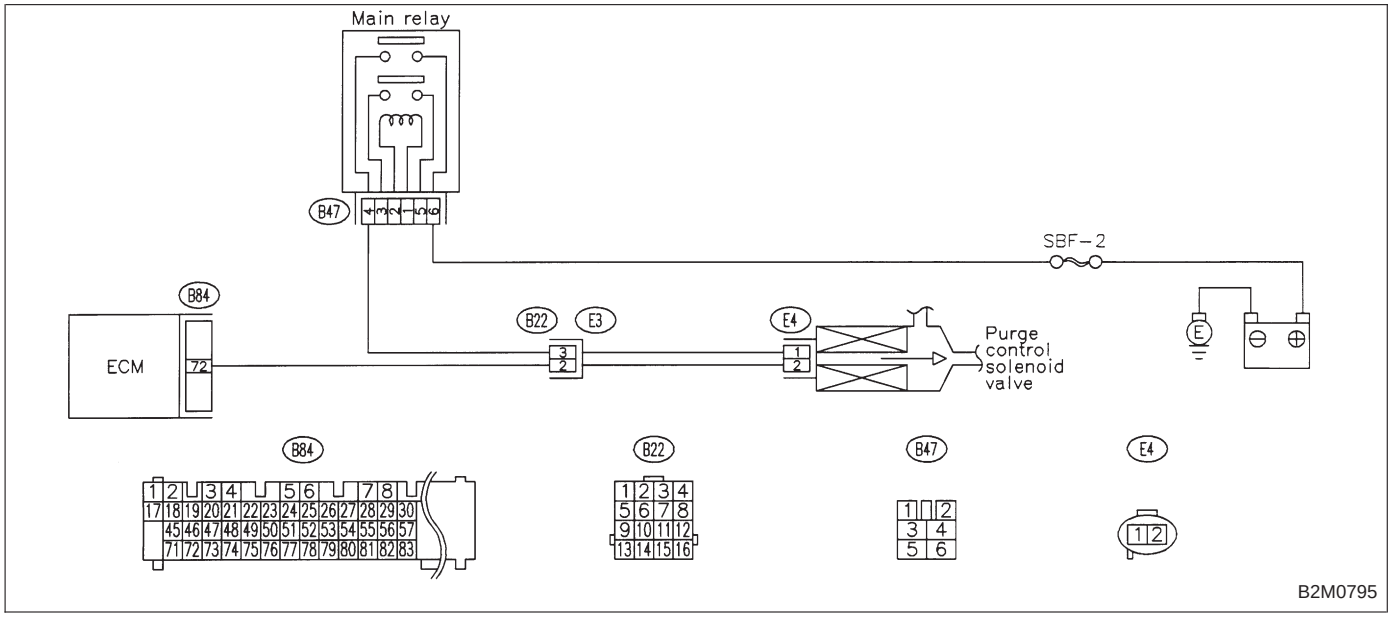
NOTE:
Check canister purge control system.
<Ref. to 2-7 [T10AS0].>

OBD	(FB1)
P0443	<CPC>

OBD0335

AT: DTC P0443 — EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT LOW INPUT —

WIRING DIAGRAM:



NOTE:
Check purge control solenoid valve circuit.
<Ref. to 2-7 [T10AT0].>

OBD (FB1)

P0446<VCMSOL_LO>

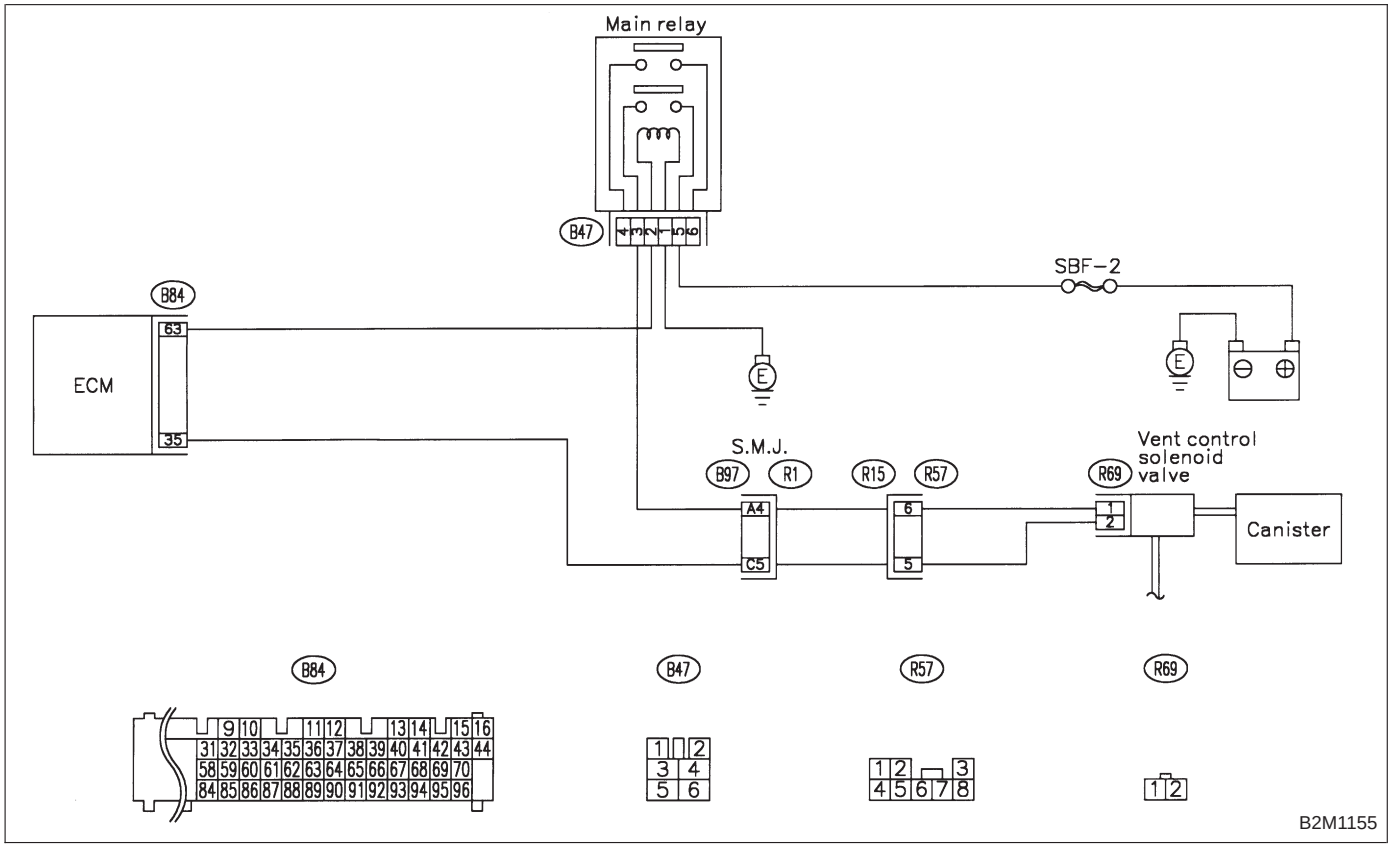
B2M1098

AU: DTC P0446 — EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL LOW INPUT —

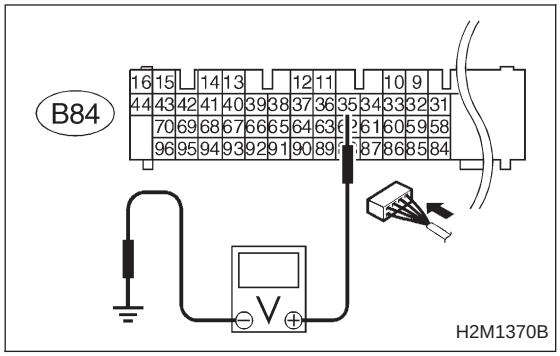
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



11AU1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 35 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Go to next CHECK .

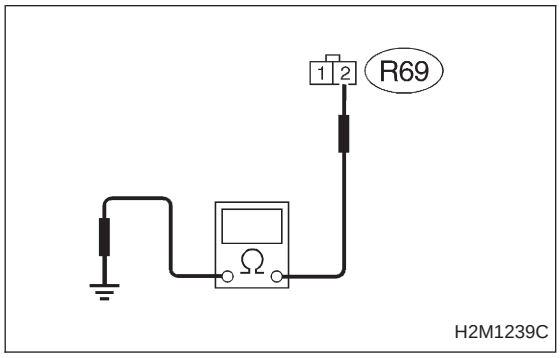
NO : Go to step **11AU2**.

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. (However, the possibility of poor contact still remains.)

NOTE:
In this case, repair the following:
- Poor contact in vent control solenoid valve connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (B97 and R57)



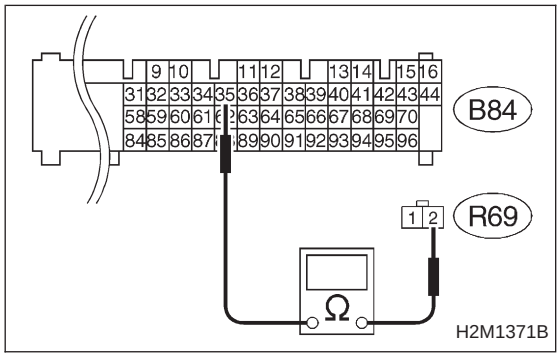
11AU2	CHECK HARNESS BETWEEN VENT CONTROL SOLENOID VALVE AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connectors from vent control solenoid valve and ECM.
3) Measure resistance of harness between vent control solenoid valve connector and chassis ground.

CHECK ***: Connector & terminal (R69) No. 2 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between ECM and vent control solenoid valve connector.

NO : Go to next step 4).



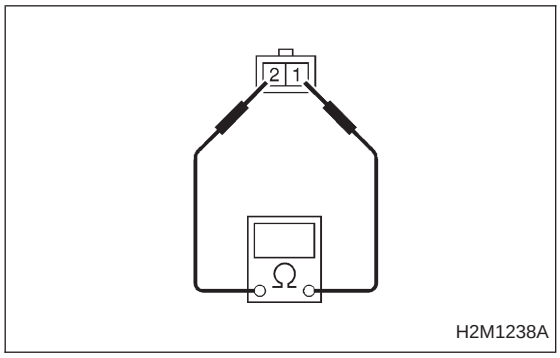
4) Measure resistance of harness between ECM and vent control solenoid valve connector.

CHECK ***: Connector & terminal (B84) No. 35 — (R69) No. 2: Is the voltage less than 1 Ω?***

YES : Go to step **11AU3**.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
● Open circuit in harness between ECM and vent control solenoid valve connector
● Poor contact in coupling connectors (B97 and R57)



H2M1238A

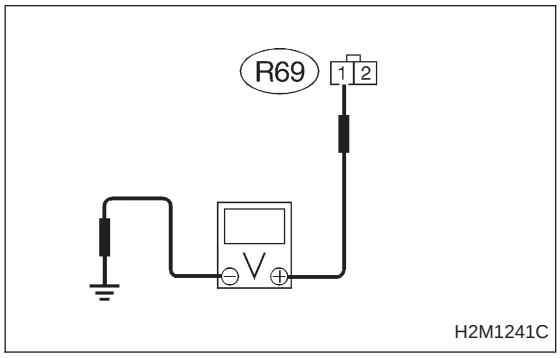
11AU3	CHECK VENT CONTROL SOLENOID VALVE.

Measure resistance between vent control solenoid valve terminals.

CHECK : ***Terminals***
No. 1 — No. 2:
Is the resistance between 10 and 100 Ω?

YES : Go to step **11AU4**.

NO : Replace vent control solenoid valve.



H2M1241C

11AU4	CHECK POWER SUPPLY TO VENT CONTROL SOLENOID VALVE.

1) Turn ignition switch to ON.
2) Measure voltage between vent control solenoid valve and chassis ground.

CHECK : ***Connector & terminal***
(R69) No. 1 (+) — Chassis ground (−):
Is the voltage more than 10 V?

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
● Open circuit in harness between main relay and vent control solenoid valve
● Poor contact in coupling connectors (B97 and R57)
● Poor contact in main relay connector

CHECK : ***Is there poor contact in vent control solenoid valve connector?***

YES : Repair poor contact in vent control solenoid valve connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

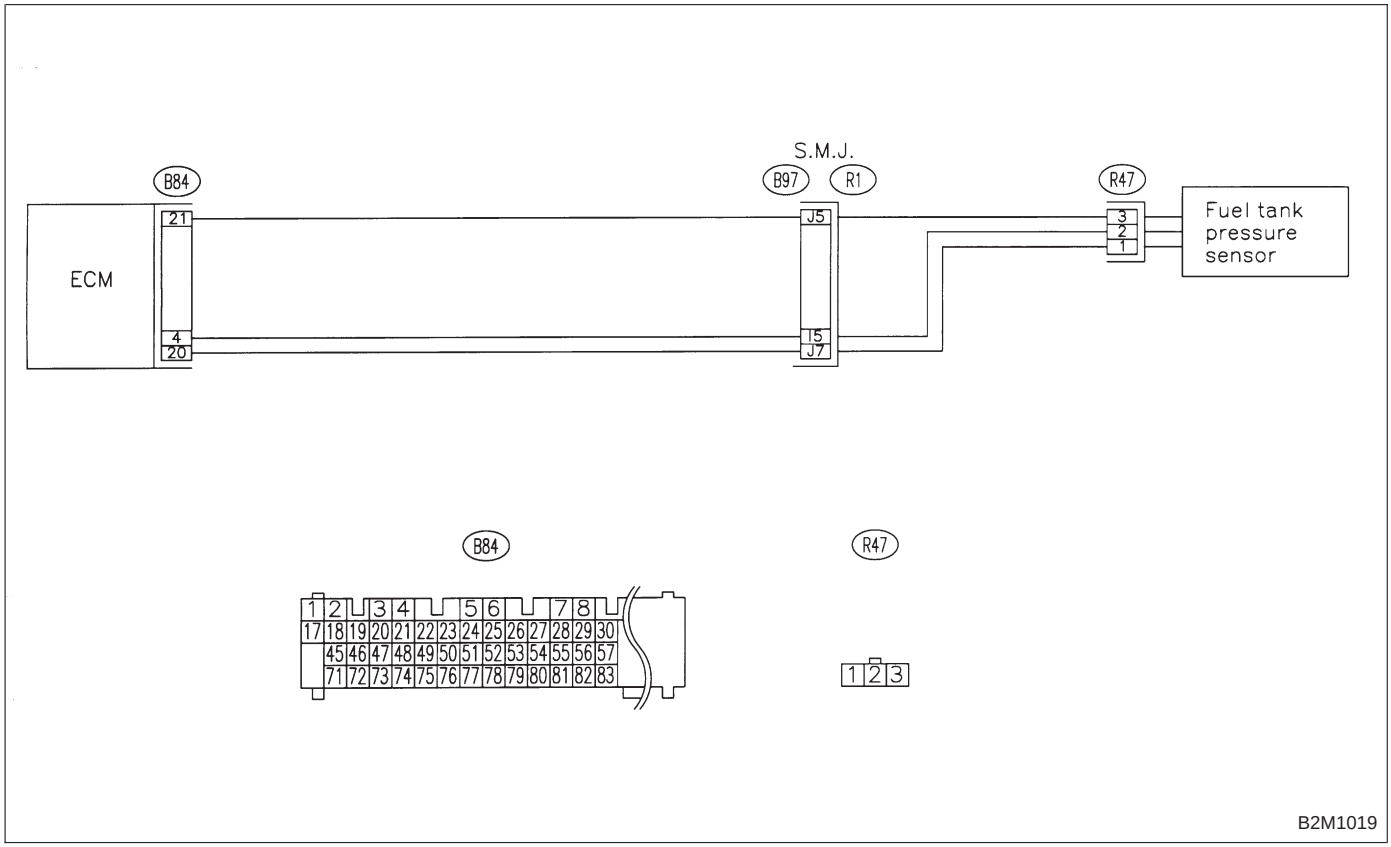
OBD (FB1)

P0451 <TNKP_F>

H2M1377

AV: DTC P0451 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR RANGE/PERFORMANCE PROBLEM —

WIRING DIAGRAM:



B2M1019

NOTE:
Check fuel tank pressure control system.
<Ref. to 2-7 [T10AV0].>

OBD (FB1)

P0452 <TNKP_LOW>

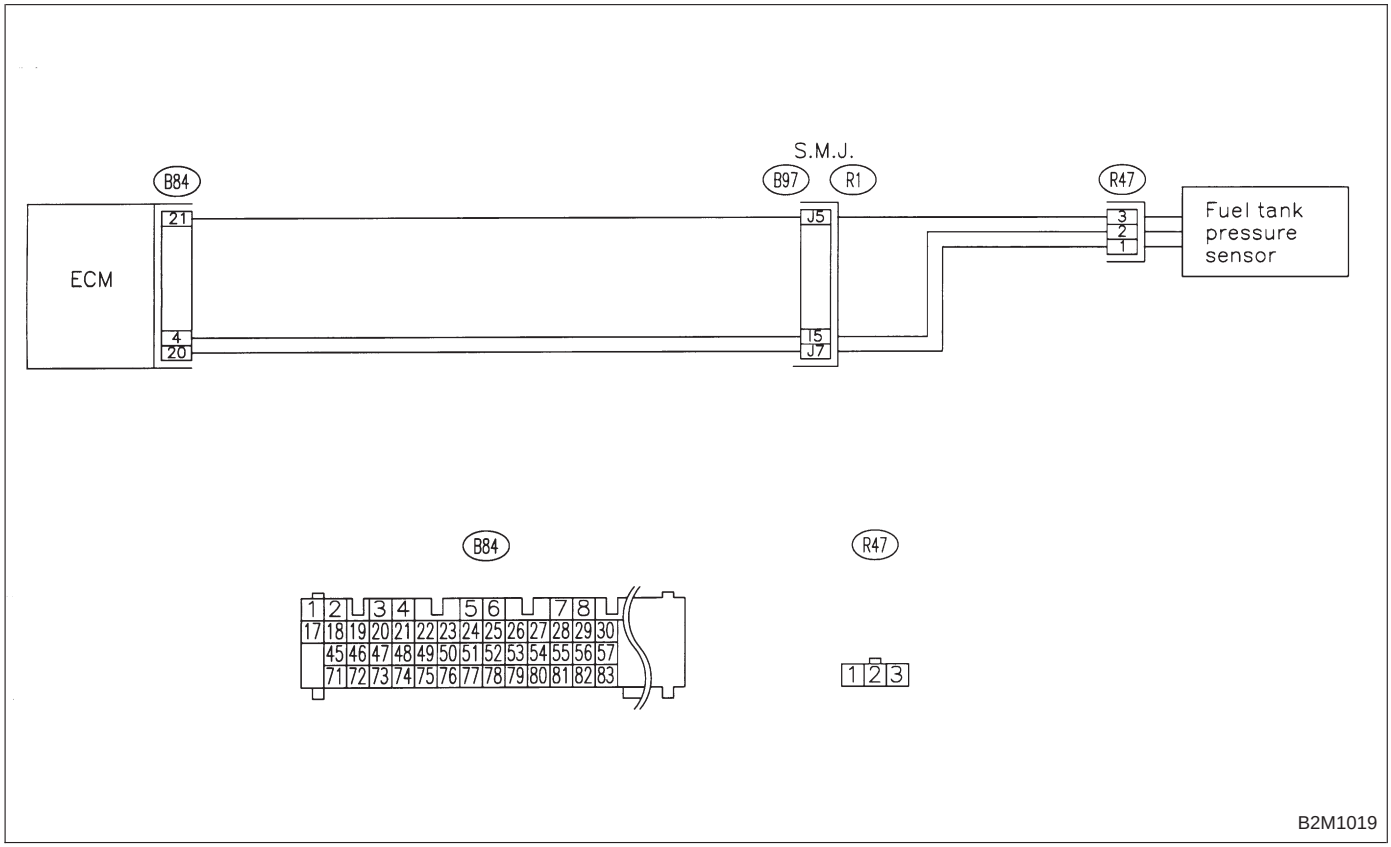
B2M1099

AW: DTC P0452 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT —

DTC DETECTING CONDITION:

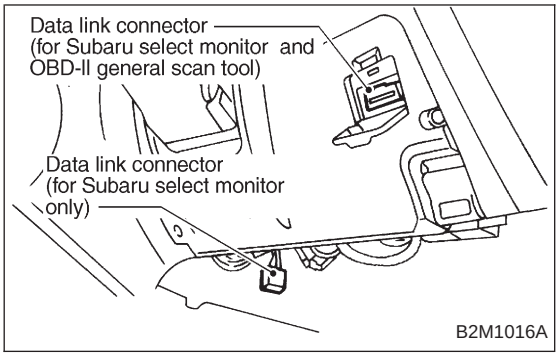
- Immediately at fault recognition

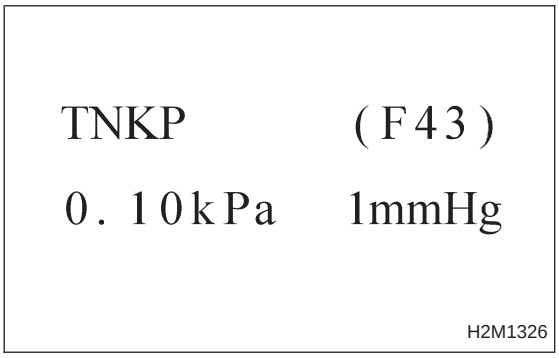
WIRING DIAGRAM:



B2M1019

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>





11AW1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

1) Turn ignition switch to OFF.
2) Remove fuel filler cap.
3) Install fuel filler cap.
4) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
5) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
6) Read the data on Subaru Select Monitor or the OBD-II general scan tool.

● Subaru Select Monitor

Designate mode using function key.

Function mode: F43

● F43: Display shows pressure signal value sent from fuel tank pressure sensor.

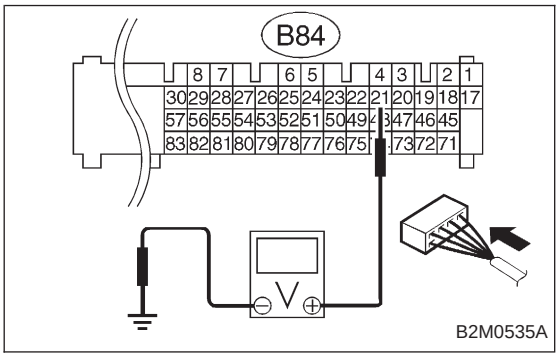
CHECK ***: Is the value less than −2.8 kPa in function mode F43?***

YES : Go to step **11AW2**.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time.

● OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



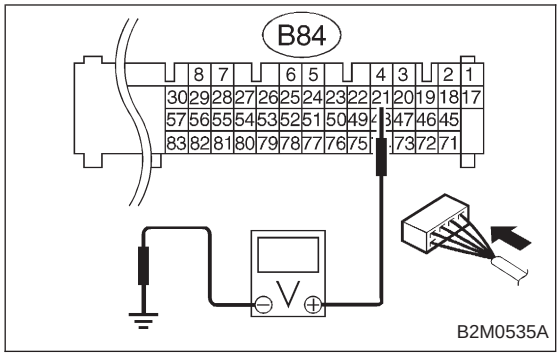
11AW2	CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

1) Measure voltage between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 21 (+) — Chassis ground (−): Is the voltage more than 4.5 V?***

YES : Go to next step 2).

NO : Go to next CHECK .

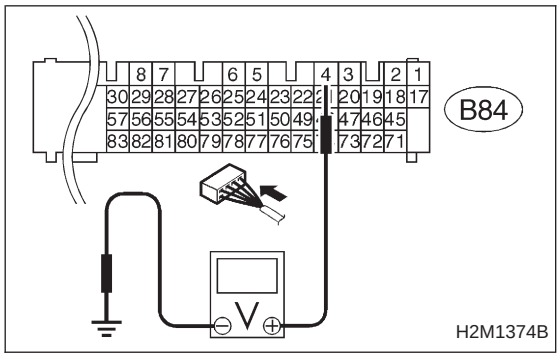


CHECK : ***Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?***

YES : Repair poor contact in ECM connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

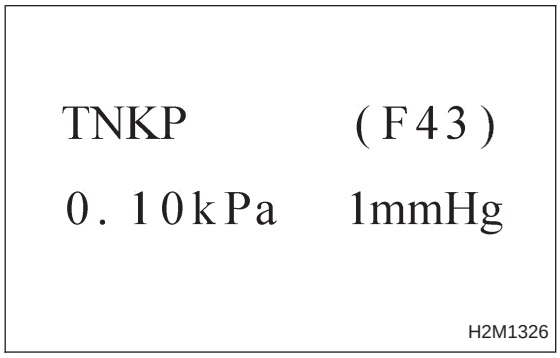


2) Measure voltage between ECM and chassis ground.

CHECK : ***Connector & terminal (B84) No. 4 (+) — Chassis ground (−): Is the voltage less than 0.2 V?***

YES : Go to step **11AW3**.

NO : Go to next step 3).



3) Read data on Subaru Select Monitor.
● Subaru Select Monitor
Designate mode using function key.

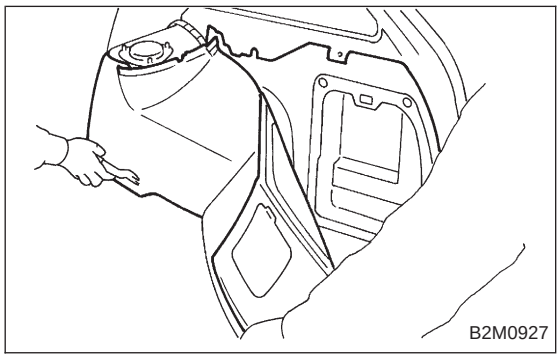
Function mode: F43

● F43: Display shows pressure signal value sent from fuel tank pressure sensor.

CHECK : ***Does the value change more than −2.8 kPa by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?***

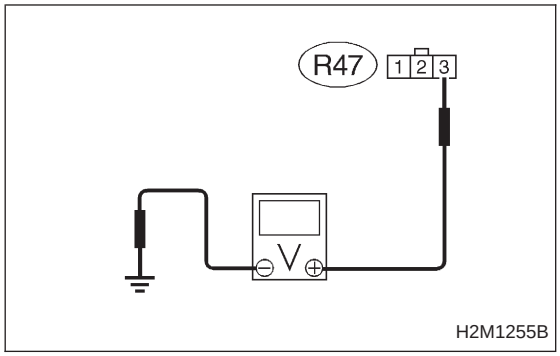
YES : Repair poor contact in ECM connector.

NO : Go to step **11AW3**.



11AW3	**CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.**

1) Turn ignition switch to OFF.
2) Detach right side rear quarter trim panel.
3) Remove right side rear quarter trim pocket.
4) Detach right side rear quarter insulator.



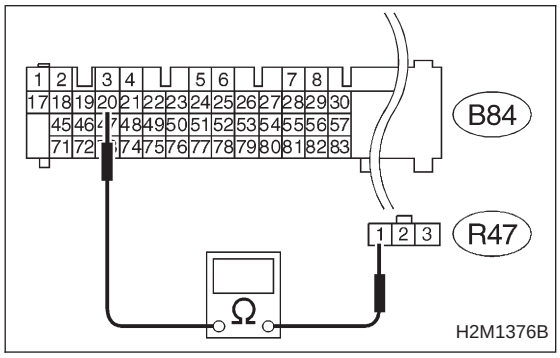
5) Disconnect connector from fuel tank pressure sensor.
6) Turn ignition switch to ON.
7) Measure voltage between fuel tank pressure sensor connector and chassis ground.

CHECK ***: Connector & terminal***
(R47) No. 3 (+) — Chassis ground (−):
Is the voltage more than 4.5 V?

YES : Go to next step 8).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and fuel tank pressure sensor connector
- Poor contact in coupling connector (B97)



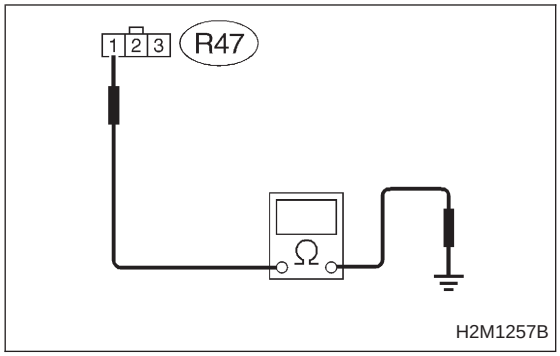
8) Turn ignition switch to OFF.
9) Disconnect connector from ECM.
10) Measure resistance of harness between ECM and pressure sensor connector.

CHECK ***: Connector & terminal***
(B84) No. 20 — (R47) No. 1:
Is the resistance less than 1 Ω?

YES : Go to next step 11).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and fuel tank pressure sensor connector
- Poor contact in coupling connector (B97)



11) Measure resistance of harness between fuel tank pressure sensor connector and chassis ground.

CHECK ***: Connector & terminal (R47) No. 1 — Chassis ground: Is the resistance more than 500 kΩ?***

YES : Go to next CHECK .

NO : Repair ground short circuit in harness between ECM and fuel tank pressure sensor connector.

CHECK ***: Is there poor contact in fuel tank pressure sensor connector?***

YES : Repair poor contact in fuel tank pressure sensor connector.

NO : Replace fuel tank pressure sensor.

OBD (FB1)

P0453 <TNKP_HI>

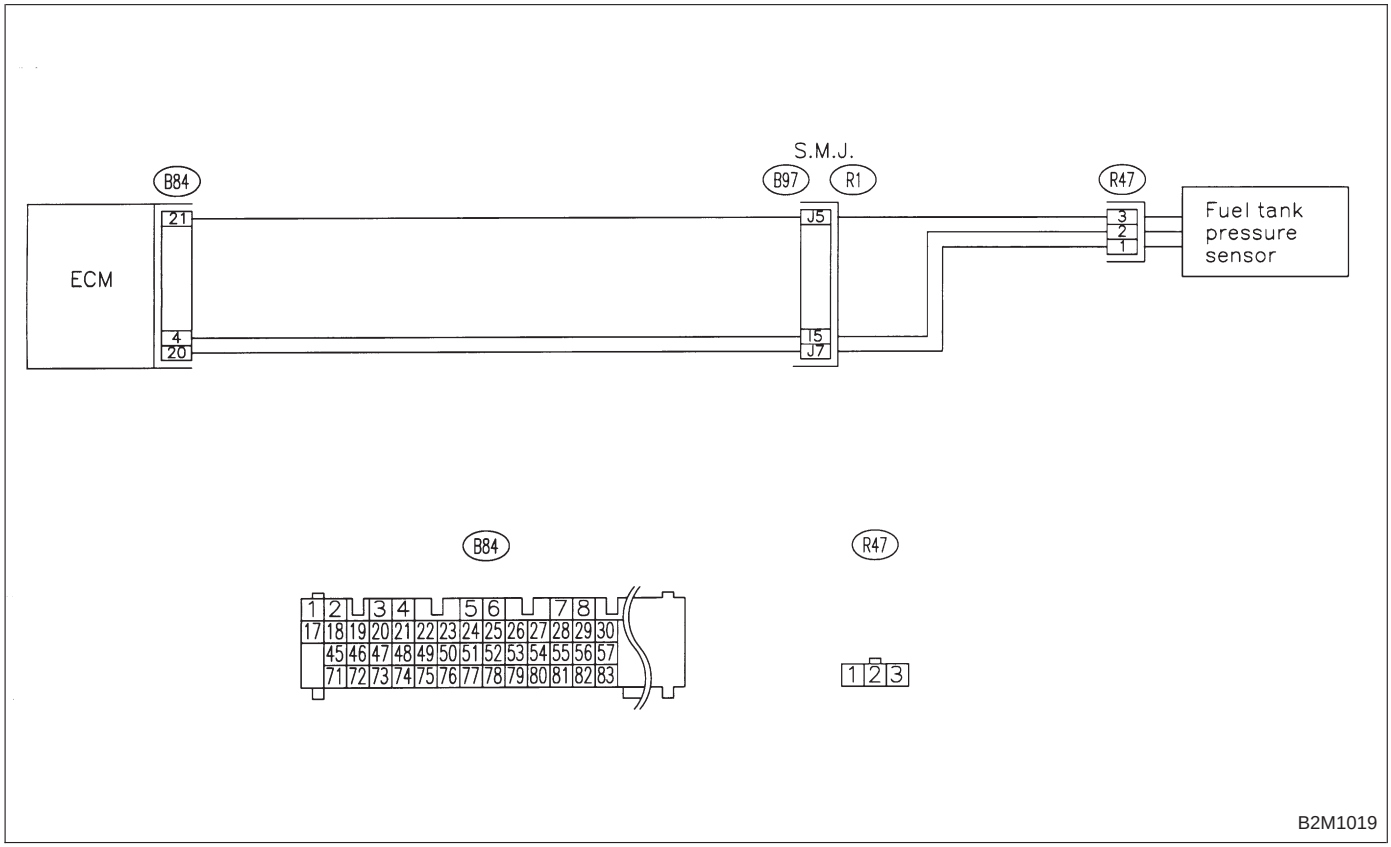
B2M1100

AX: DTC P0453 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT —

DTC DETECTING CONDITION:

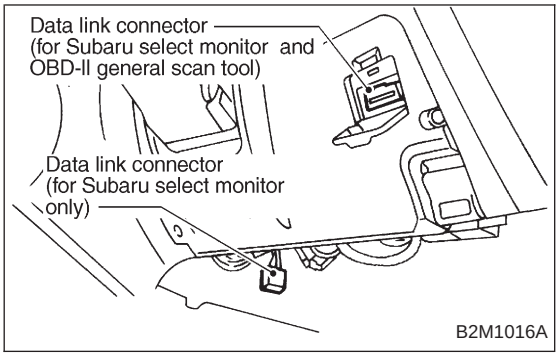
- Immediately at fault recognition

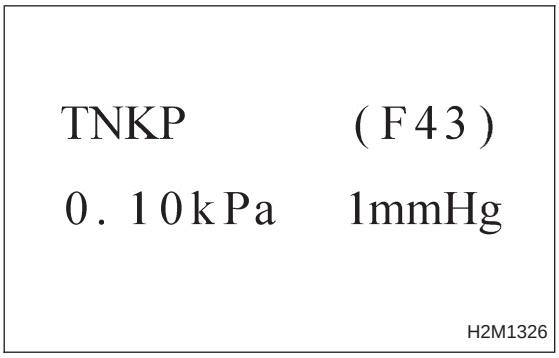
WIRING DIAGRAM:



B2M1019

CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>





11AX1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

1) Turn ignition switch to OFF.
2) Remove fuel filler cap.
3) Install fuel filler cap.
4) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
5) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
6) Read the data on Subaru Select Monitor or the OBD-II general scan tool.

● Subaru Select Monitor

Designate mode using function key.

Function mode: F43

● F43: Display shows pressure signal value sent from fuel tank pressure sensor.

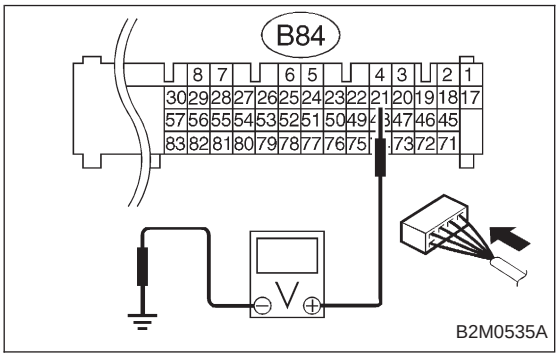
CHECK ***: Is the value more than 2.8 kPa in function mode F43?***

YES : Go to step **11AX4**.

NO : Go to step **11AX2**.

● OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



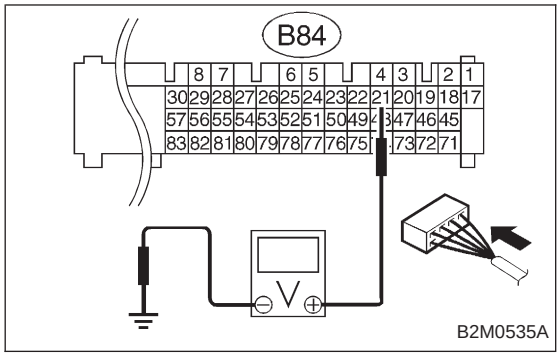
11AX2	CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

1) Measure voltage between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 21 (+) — Chassis ground (−): Is the voltage more than 4.5 V?***

YES : Go to next step 2).

NO : Go to next CHECK .

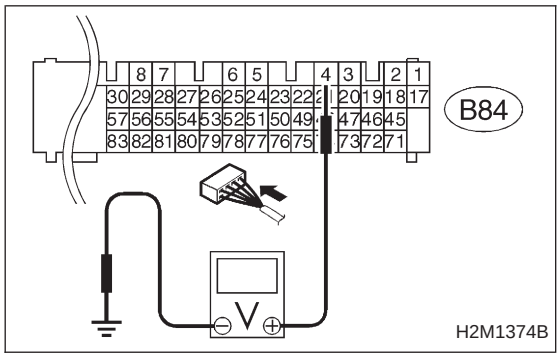


CHECK : ***Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?***

YES : Repair poor contact in ECM connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

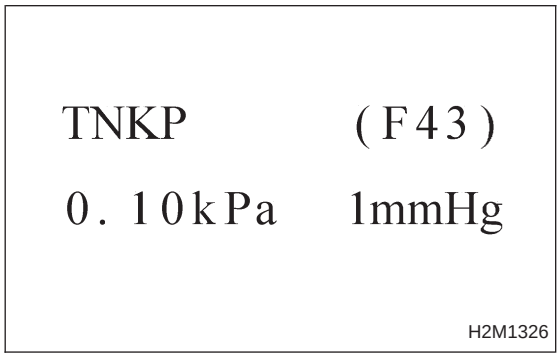


2) Measure voltage between ECM and chassis ground.

CHECK : ***Connector & terminal (B84) No. 4 (+) — Chassis ground (−): Is the voltage less than 0.2 V?***

YES : Go to step **11AX3**.

NO : Go to next step 3).



3) Read data on Subaru Select Monitor.

● Subaru Select Monitor

Designate mode using function key.

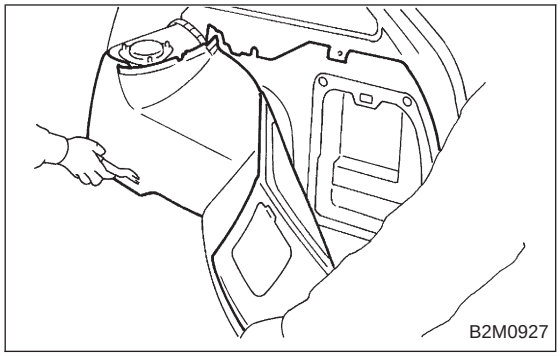
Function mode: F43

● F43: Display shows pressure signal value sent from fuel tank pressure sensor.

CHECK : ***Does the value change more than −2.8 kPa by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?***

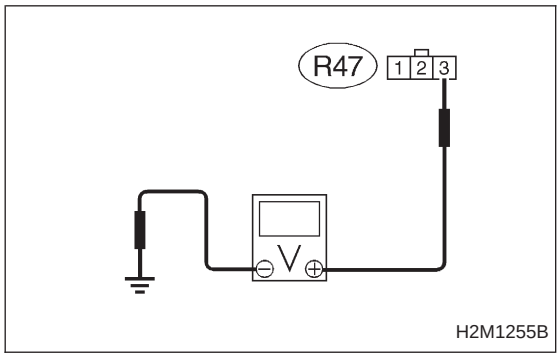
YES : Repair poor contact in ECM connector.

NO : Go to step **11AX3**.


B2M0927

11AX3	CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.

1) Turn ignition switch to OFF.
2) Detach right side rear quarter trim panel.
3) Remove right side rear quarter trim pocket.
4) Detach right side rear quarter insulator.



H2M1255B

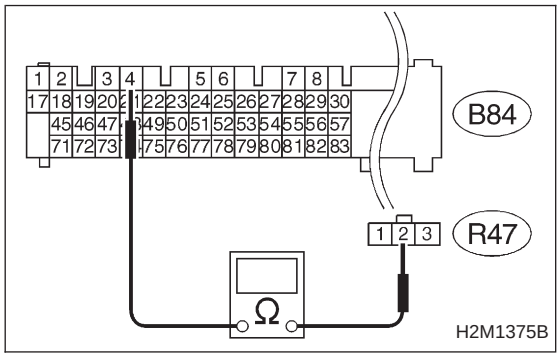
5) Disconnect connector from fuel tank pressure sensor.
6) Turn ignition switch to ON.
7) Measure voltage between fuel tank pressure sensor connector and chassis ground.

CHECK ***: Connector & terminal***
(R47) No. 3 (+) — Chassis ground (−):
Is the voltage more than 4.5 V?

YES : Go to next step 8).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and fuel tank pressure sensor connector
- Poor contact in coupling connector (B97)



H2M1375B

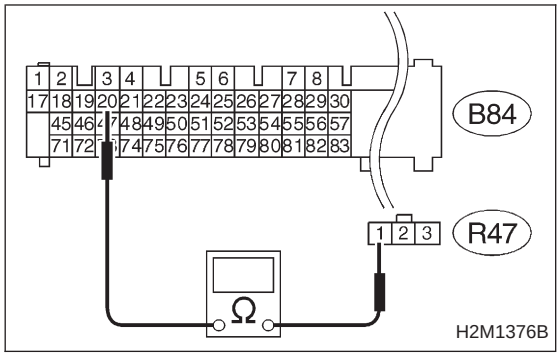
8) Turn ignition switch to OFF.
9) Disconnect connector from ECM.
10) Measure resistance of harness between ECM and pressure sensor connector.

CHECK ***: Connector & terminal***
(B84) No. 4 — (R47) No. 2:
Is the resistance less than 1 Ω?

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM and fuel tank pressure sensor connector
- Poor contact in coupling connector (B97)



CHECK : ***Connector & terminal (B84) No. 20 — (R47) No. 1: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair harness and connector.

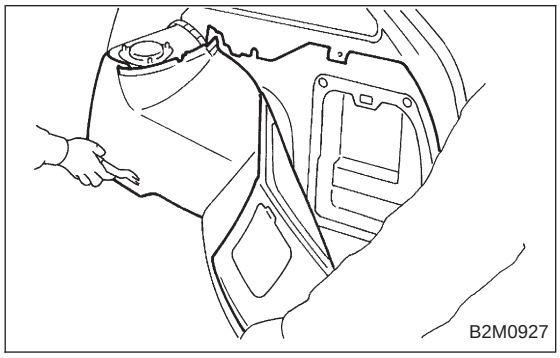
NOTE:
In this case, repair the following:

- Open circuit in harness between ECM and fuel tank pressure sensor connector
- Poor contact in coupling connector (B97)

CHECK : ***Is there poor contact in fuel tank pressure sensor connector?***

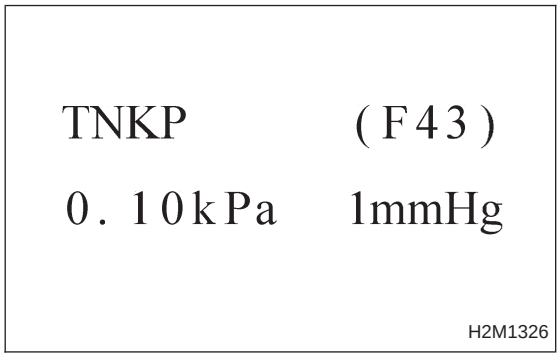
YES : Repair poor contact in fuel tank pressure sensor connector.

NO : Replace fuel tank pressure sensor.



11AX4	CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.

1) Turn ignition switch to OFF and Subaru Select Monitor or the OBD-II general scan tool switch to OFF.
2) Detach right side rear quarter trim panel.
3) Remove right side rear quarter trim pocket.
4) Detach right side rear quarter insulator.



5) Disconnect connector from fuel tank pressure sensor.
6) Remove fuel filler cap.
7) Install fuel filler cap.
8) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
9) Read data on Subaru select monitor or the OBD-II general scan tool.

- Subaru Select Monitor

Designate mode using function key.

Function mode: F43

CHECK : ***Is the value more than 2.8 kPa in function mode F43?***

YES : Repair battery short circuit in harness between ECM and fuel tank pressure sensor connector.

NO : Replace fuel tank pressure sensor.

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

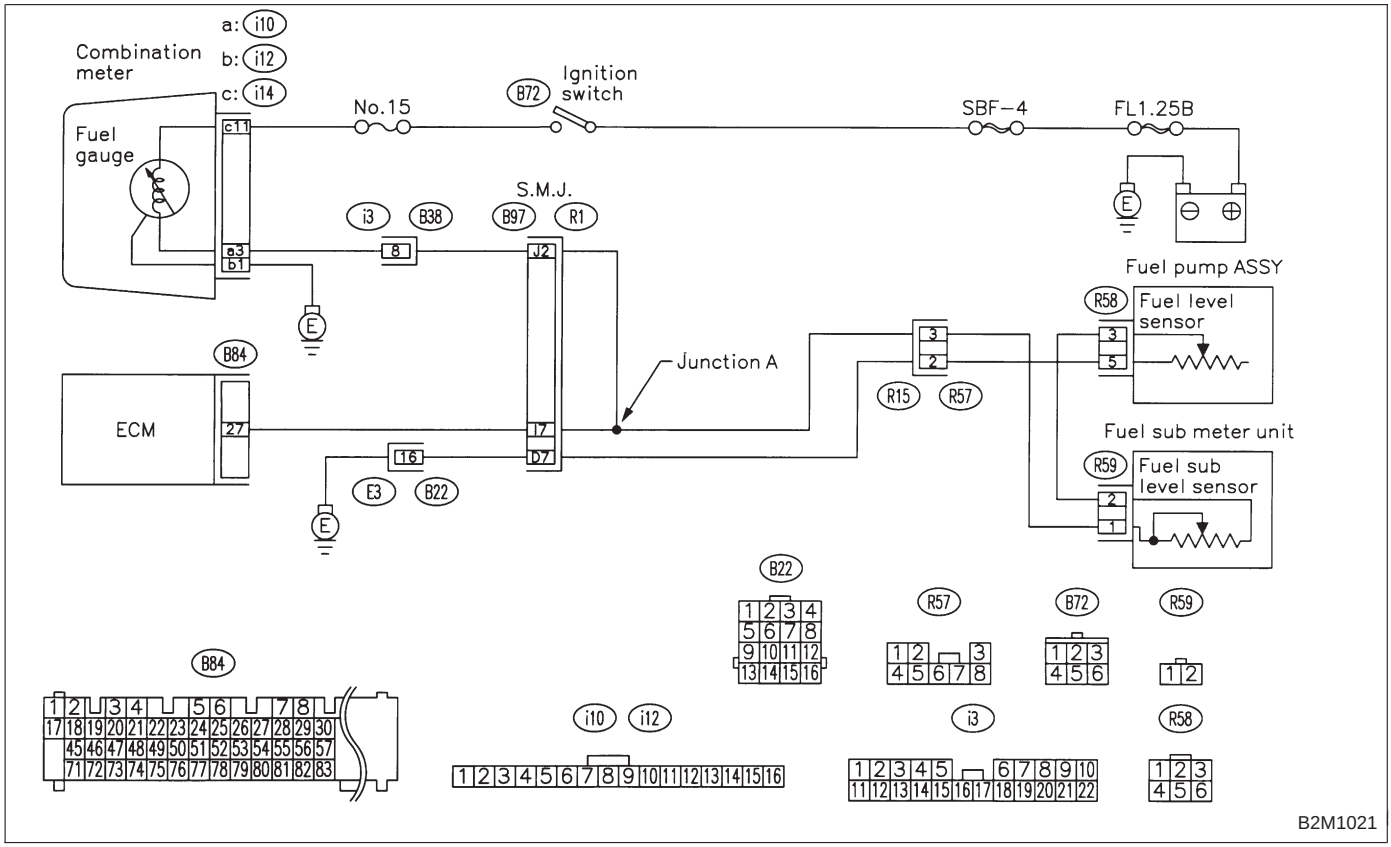
OBD (FB1)
P0461 <FLVL_R>
B2M1101

AY: DTC P0461 — FUEL LEVEL SENSOR CIRCUIT RANGE/ PERFORMANCE PROBLEM —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

11AY1	**CHECK DTC P0462 OR P0463 ON DISPLAY.**

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0462 or P0463?***

YES : Inspect DTC P0462 or P0463 using “11. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T11TA0].>

NOTE:
In this case, it is not necessary to inspect this trouble.

NO : Replace fuel sending unit and fuel sub meter unit.

OBD (FB1)

P0462 <FLVL_LOW>

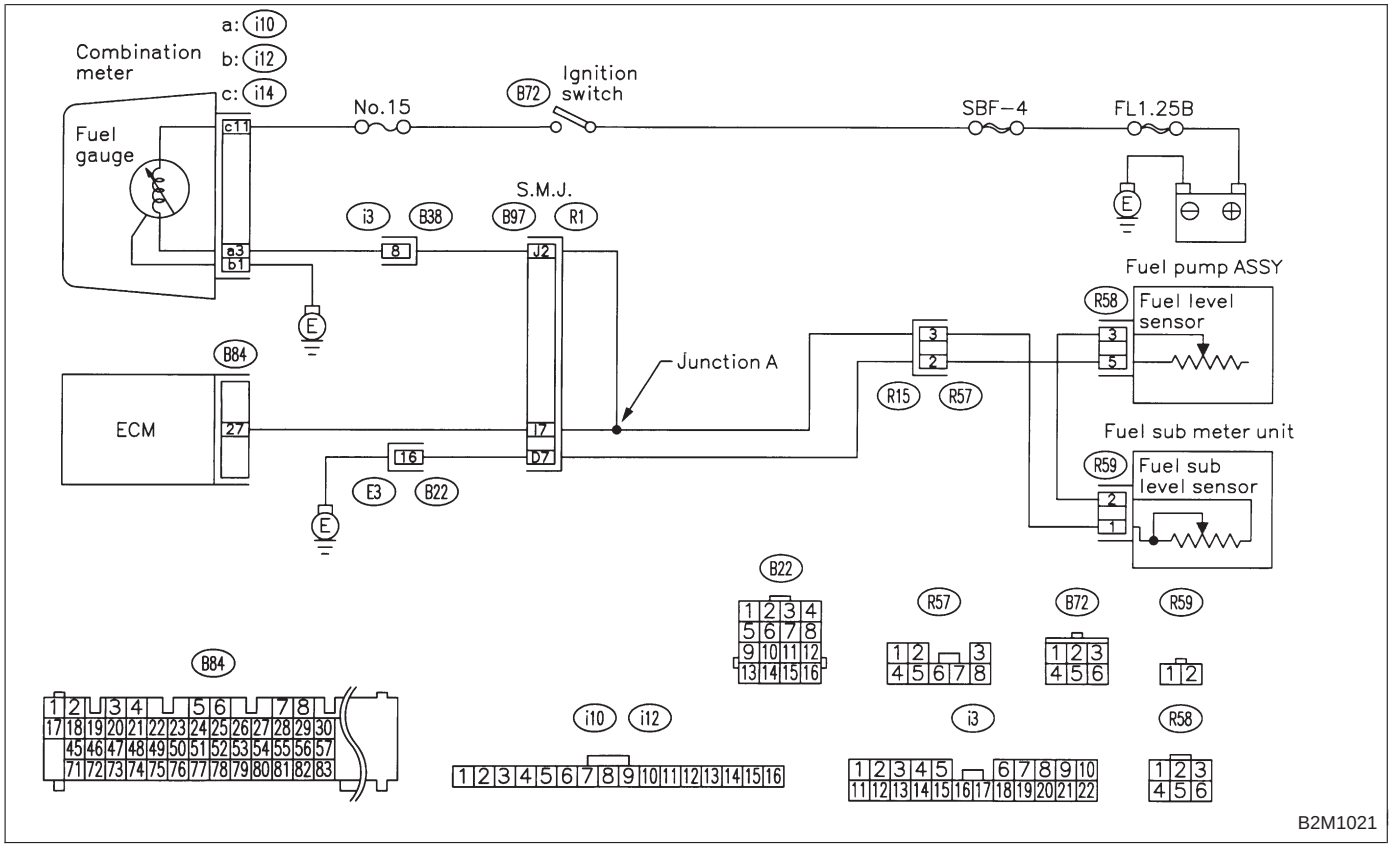
B2M1102

AZ: DTC P0462 — FUEL LEVEL SENSOR CIRCUIT LOW INPUT —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



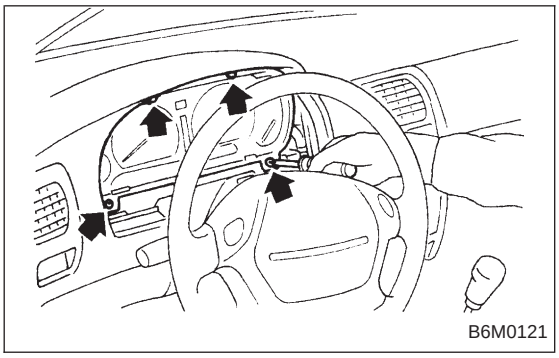
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

11AZ1	**CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.**

CHECK ***: Does speedometer and tachometer operate normally?***

YES : Go to step **11AZ3**.

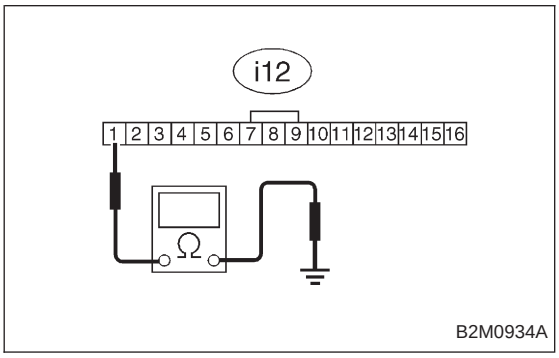
NO : Go to step **11AZ2**.



B6M0121

11AZ2	**CHECK GROUND CIRCUIT OF COMBINATION METER.**

1) Turn ignition switch to OFF.
2) Pull out combination meter from instrument panel. <Ref. to 6-2 [W13A1].>
3) Disconnect connector from combination meter.



B2M0934A

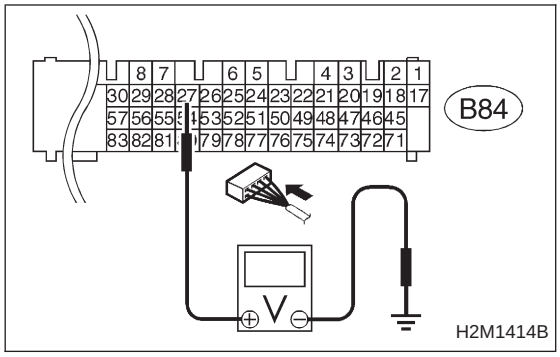
4) Measure resistance of harness between combination meter connector and chassis ground.

CHECK ***: Connector & terminal (i12) No. 1 — Chassis ground: Is resistance less than 5 Ω?***

YES : Repair or replace combination meter.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between combination meter connector and grounding terminal
- Poor contact in combination meter connector
- Poor contact in grounding terminal



11AZ3	CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

1) Turn ignition switch to ON. (Engine OFF)
2) Measure voltage between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 27 (+) — Chassis ground (−): Is the voltage less than 0.12 V?***

YES : Go to step **11AZ4**.

NO : Go to next CHECK .

CHECK ***: Does the value change less than 0.12 V by shaking harness and connector of ECM while monitoring the value with Subaru Select Monitor?***

- Subaru Select Monitor

Designate mode using function key.

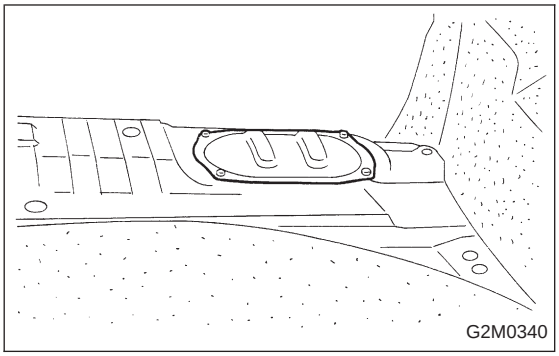
Function mode: F45

- F45: Fuel level sensor output signal is indicated.

YES : Repair poor contact in ECM connector.

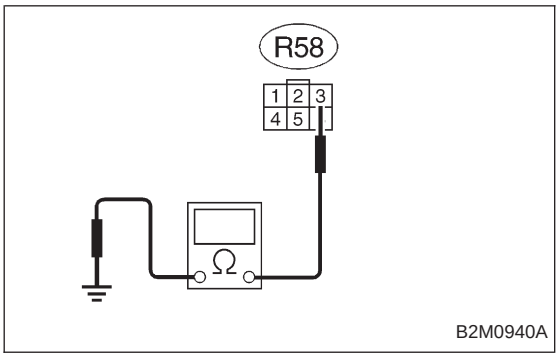
NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.

NOTE:
In this case, repair the following:
- Poor contact in fuel pump connector
- Poor contact in combination meter connector
- Poor contact in ECM connector
- Poor contact in coupling connector (i3, B22, B97 and R57)


G2M0340

11AZ4	CHECK HARNESS BETWEEN ECM, COMBINATION METER AND FUEL PUMP CONNECTOR.

1) Turn ignition switch to OFF.
2) Remove fuel pump access hole lid located on the right rear of luggage compartment floor.



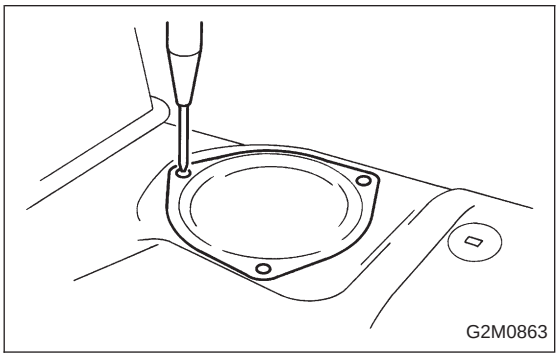
B2M0940A

3) Disconnect connector from fuel pump.
4) Measure resistance of harness between fuel pump connector and chassis ground.

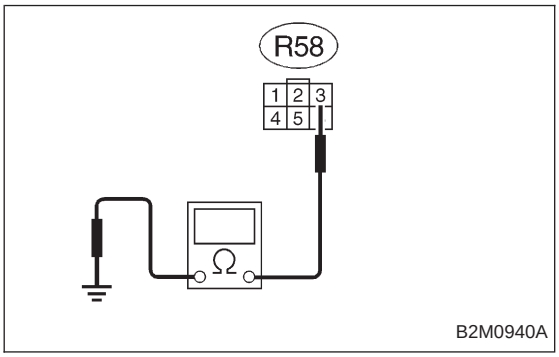
CHECK ***: Connector & terminal (R58) No. 3 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Go to next step 5).

NO : Go to step **11AZ5**.


G2M0863

5) Remove service hole cover located on the left rear of luggage compartment floor.



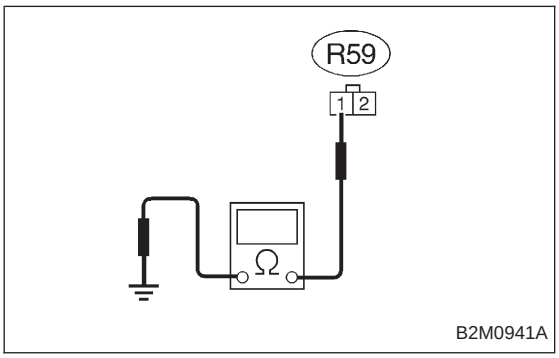
B2M0940A

6) Disconnect connector from fuel sub meter unit.
7) Measure resistance of harness between fuel pump connector and chassis ground.

CHECK ***: Connector & terminal (R58) No. 3 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between fuel pump and fuel sub meter unit connector.

NO : Go to next step 8).



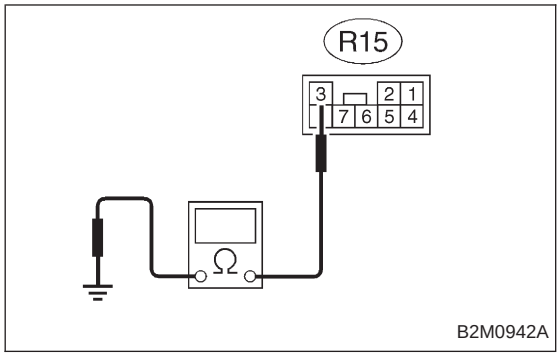
B2M0941A

8) Separate fuel tank cord connector (R57) and rear wiring harness connector (R15).
9) Measure resistance of harness between fuel sub meter unit connector and chassis ground.

CHECK ***: Connector & terminal (R59) No. 1 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in fuel tank cord.

NO : Go to next step 10).

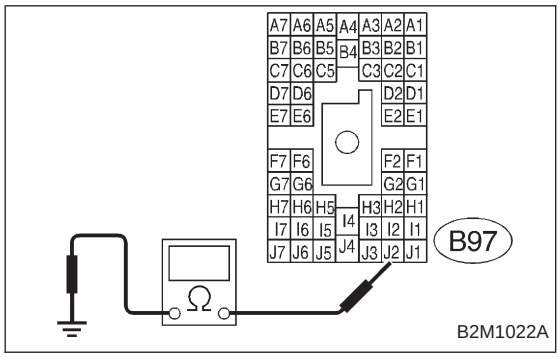


10) Separate rear wiring harness connector (R1) and bulkhead wiring harness connector (B97).
11) Measure resistance of harness between rear wiring harness connector and chassis ground.

CHECK ***: Connector & terminal (R15) No. 3 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in rear wiring harness.

NO : Go to next step 12).

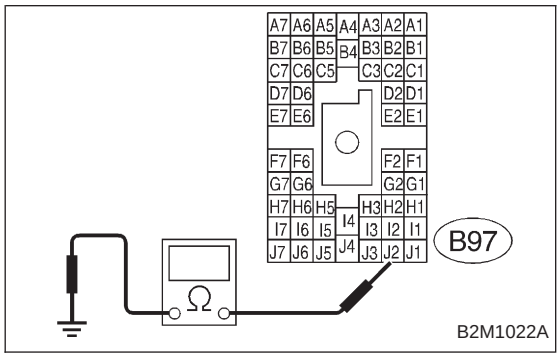


12) Measure resistance of harness between bulkhead wiring connector and chassis ground.

CHECK ***: Connector & terminal (B97) No. J2 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Go to next step 13).

NO : Repair ground short circuit in harness between S.M.J. and ECM connector.

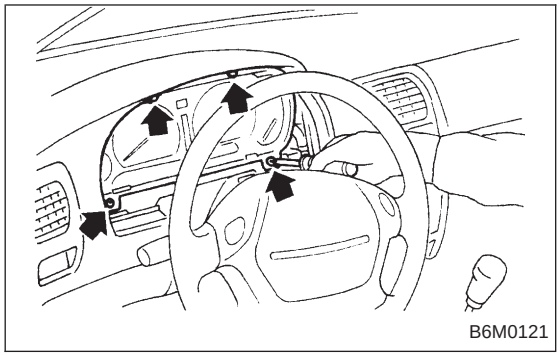


13) Separate bulkhead wiring harness connector (B38) and instrument panel wiring harness connector (i3).
14) Measure resistance of harness between bulkhead wiring harness connector and chassis ground.

CHECK ***: Connector & terminal (B97) No. J2 — Chassis ground: Is the resistance less than 10 Ω?***

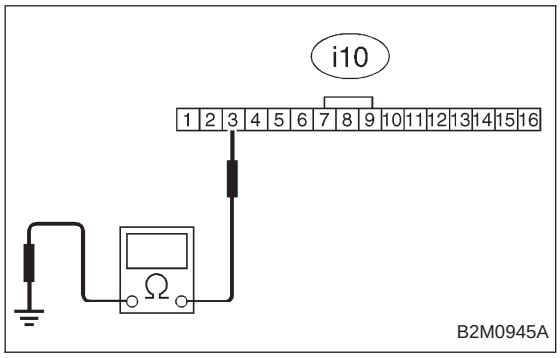
YES : Repair ground short circuit in bulkhead wiring harness.

NO : Repair ground short circuit in instrument panel wiring harness.


B6M0121

11AZ5	CHECK HARNESS BETWEEN COMBINATION METER AND FUEL PUMP CONNECTOR.

1) Connect connector to fuel pump.
2) Pull out combination meter from instrument panel. <Ref. to 6-2 [W13A1].>
3) Disconnect connector from combination meter.



B2M0945A

4) Measure resistance of harness between combination meter connector and chassis ground.

CHECK ***: Connector & terminal (i10) No. 3 — Chassis ground: Is the resistance less than 200 Ω?***

YES : Go to step **11AZ6**.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between combination meter connector and junction A on rear wiring harness
- Poor contact in coupling connectors (i3 and B97)

11AZ6	CHECK COMBINATION METER.

1) Disconnect speedometer cable from combination meter and remove combination meter.

CHECK ***: Is the fuel meter installation screw tightened securely?***

YES : Go to next step 2).

NO : Tighten fuel meter installation screw securely.

2) Remove printed circuit plate assembly from combination meter assembly.

CHECK ***: Is there flaw or burning on printed circuit plate assembly?***

YES : Replace printed circuit plate assembly.

NO : Replace fuel meter assembly.

OBD (FB1)

P0463 <FLVL_HI>

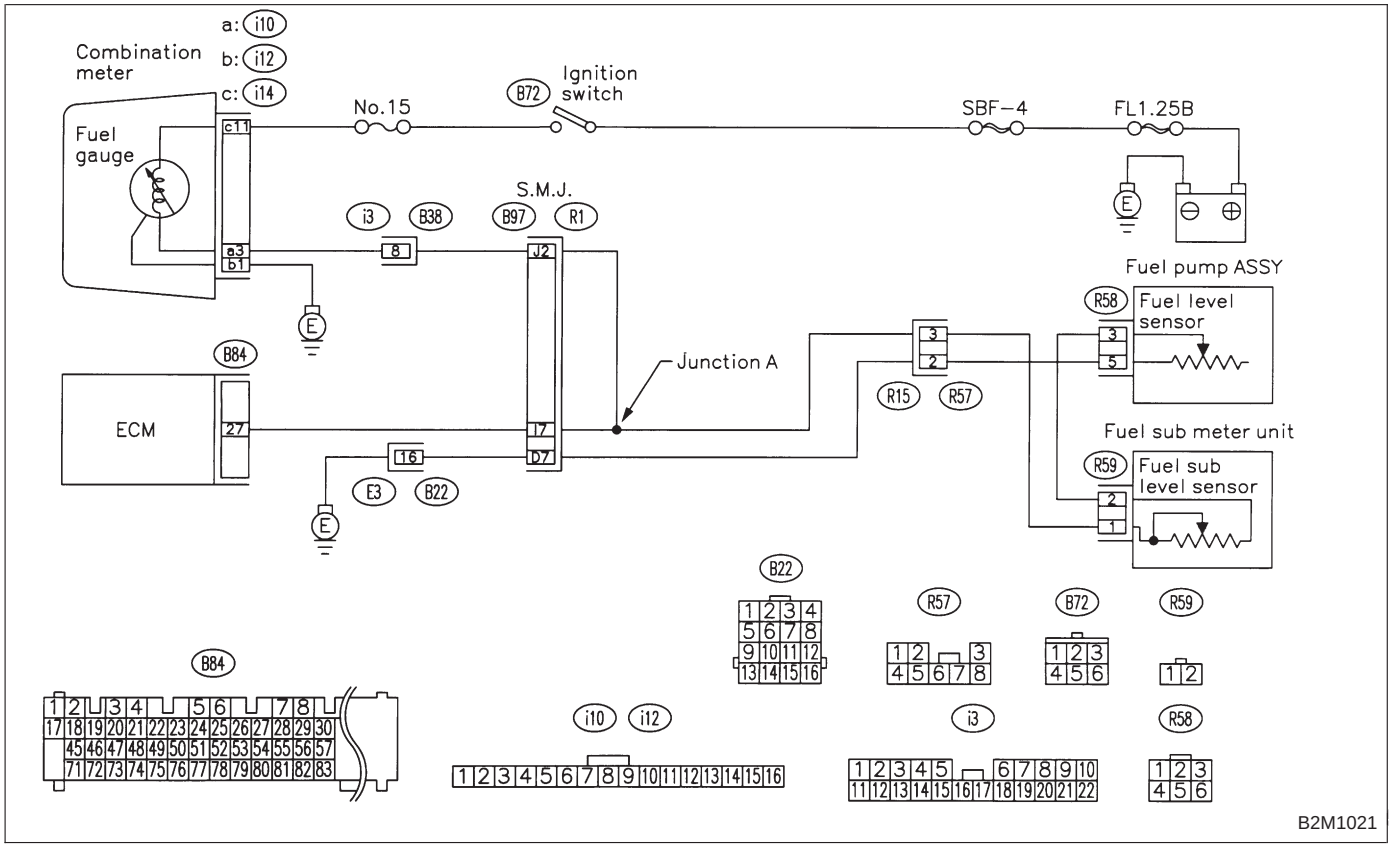
B2M1103

BA: DTC P0463 — FUEL LEVEL SENSOR CIRCUIT HIGH INPUT —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



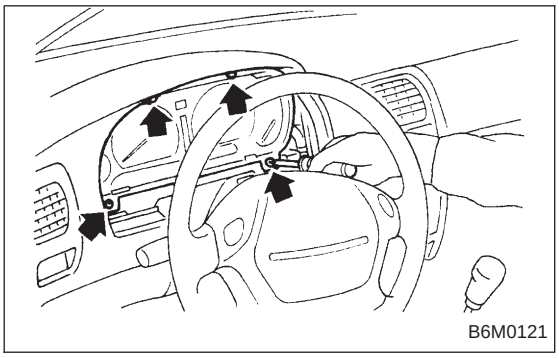
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

11BA1	CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.

CHECK ***: Does speedometer and tachometer operate normally?***

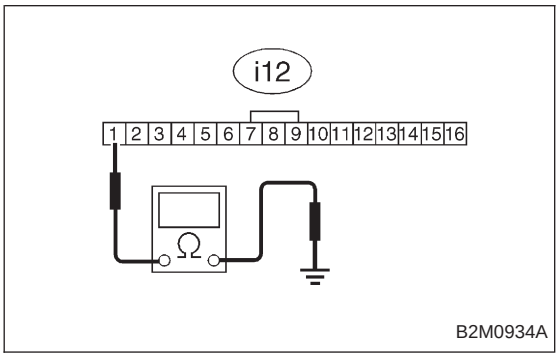
YES : Go to step **11BA3**.

NO : Go to step **11BA2**.


B6M0121

11BA2	CHECK GROUND CIRCUIT OF COMBINATION METER.

1) Turn ignition switch to OFF.
2) Pull out combination meter from instrument panel. <Ref. to 6-2 [W13A1].>
3) Disconnect connector from combination meter.



B2M0934A

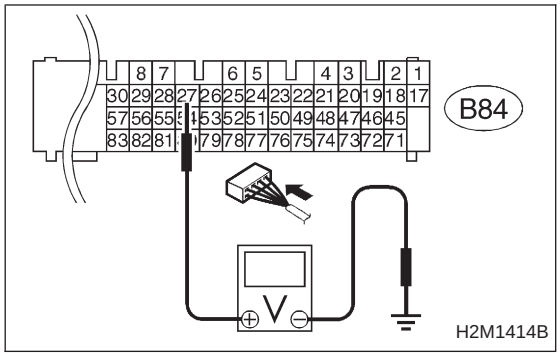
4) Measure resistance of harness between combination meter connector and chassis ground.

CHECK ***: Connector & terminal (i12) No. 1 — Chassis ground: Is resistance less than 5 Ω?***

YES : Repair or replace combination meter.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between combination meter connector and grounding terminal
- Poor contact in combination meter connector
- Poor contact in grounding terminal



11BA3	CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

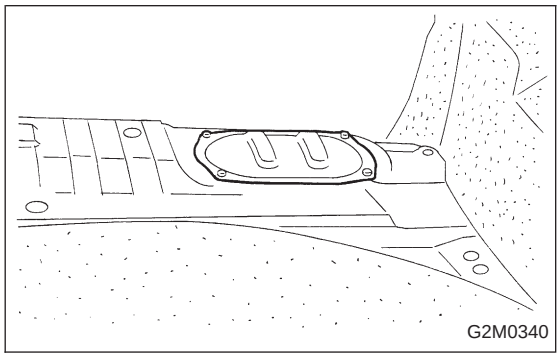
1) Turn ignition switch to ON. (Engine OFF)
2) Measure voltage between ECM connector and chassis ground.

CHECK ***: Connector & terminal (B84) No. 27 (+) — Chassis ground (−): Is the voltage more than 4.75 V?***

YES : Go to step **11BA4**.

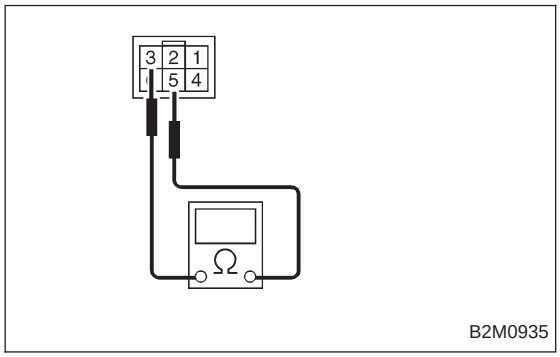
NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.

NOTE:
In this case, repair the following:
- Poor contact in fuel pump connector
- Poor contact in combination meter connector
- Poor contact in ECM connector
- Poor contact in coupling connector (i3, B22, B97 and R57)



11BA4	CHECK FUEL LEVEL SENSOR.

1) Turn ignition switch to OFF.
2) Remove fuel pump access hole lid located on the right rear of luggage compartment floor.

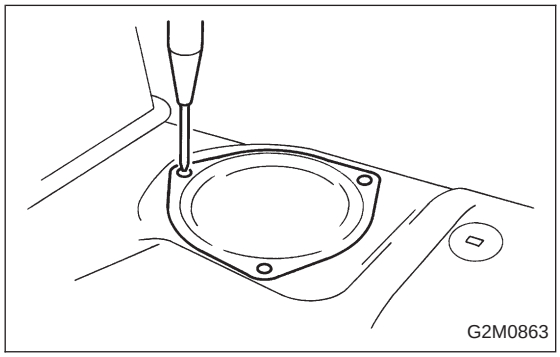


3) Disconnect connector from fuel pump.
4) Measure resistance between connector terminals of fuel pump.

CHECK ***: Terminals No. 3 — No. 5: Is the resistance less than 100 Ω?***

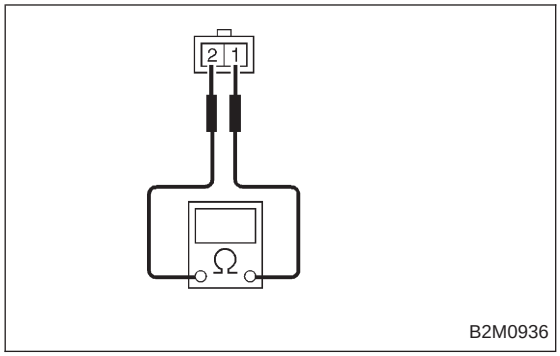
YES : Go to step **11BA5**.

NO : Replace fuel sending unit.



11BA5	CHECK FUEL SUB LEVEL SENSOR.

1) Remove service hole cover located on the left rear of luggage compartment floor.

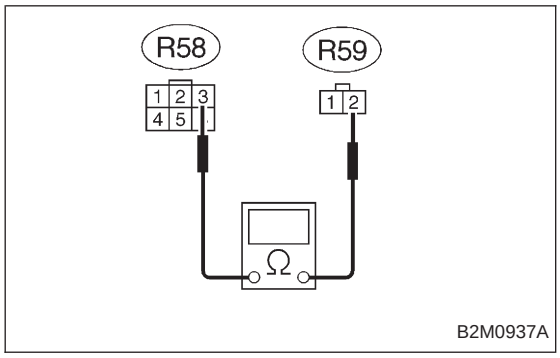


2) Disconnect connector from fuel sub meter unit.
3) Measure resistance between connector terminals of fuel sub meter unit.

CHECK : ***Terminals***
No. 1 — No. 2:
Is the resistance less than 100 Ω?

YES : Go to step **11BA6**.

NO : Replace fuel sub meter unit.



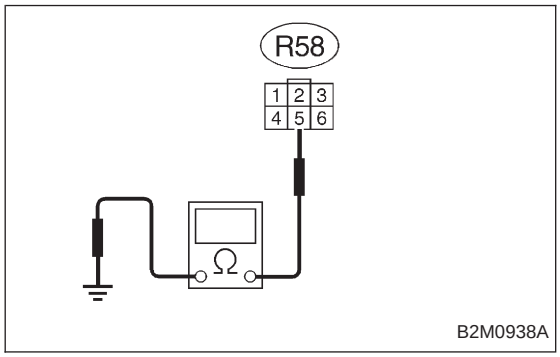
11BA6	CHECK HARNESS BETWEEN FUEL PUMP AND FUEL SUB METER UNIT CONNECTOR.

Measure resistance of harness between fuel pump and fuel sub meter unit connector.

CHECK : ***Connector & terminal***
(R58) No. 3 — (R59) No. 2:
Is the resistance less than 1 Ω?

YES : Go to step **11BA7**.

NO : Repair open circuit in harness between fuel pump and fuel sub meter unit connector.



11BA7	CHECK GROUND CIRCUIT OF FUEL LEVEL SENSOR.

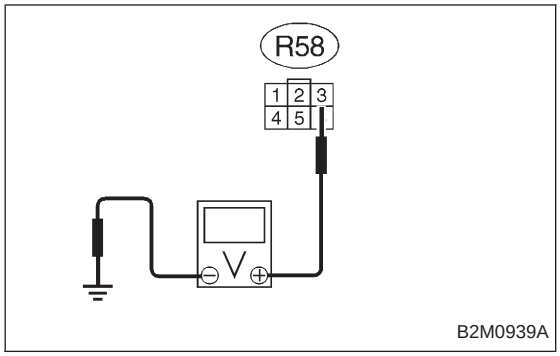
Measure resistance of harness between fuel pump connector and chassis ground.

CHECK : ***Connector & terminal***
(R58) No. 5 — Chassis ground:
Is the resistance less than 5 Ω?

YES : Go to step **11BA8**.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between fuel pump connector and chassis grounding terminal
- Poor contact in fuel pump connector
- Poor contact in coupling connectors (R57, B97 and B22)



11BA8	CHECK HARNESS BETWEEN ECM AND FUEL PUMP CONNECTOR.

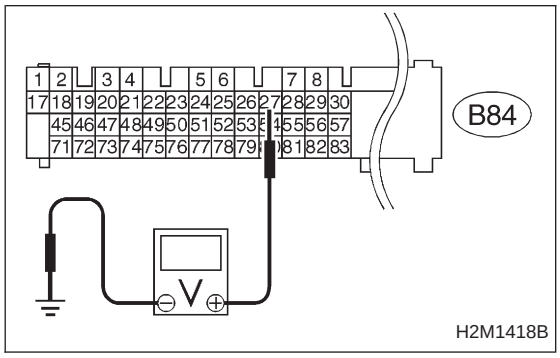
1) Connect connector to fuel sub meter unit.
2) Turn ignition switch to ON.
3) Measure voltage between fuel pump connector and chassis ground.

CHECK ***: Connector & terminal***
(R58) No. 3 (+) — Chassis ground (−):
Is the voltage less than 1 V?

YES : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between fuel pump connector and junction A on rear wiring harness
- Poor contact in fuel sub meter unit connector
- Poor contact in fuel pump connector
- Poor contact in coupling connector (R57)

NO : Go to next step 4).



4) Turn ignition switch to OFF.
5) Disconnect connector from ECM.
6) Turn ignition switch to ON.
7) Measure voltage between ECM connector and chassis ground.

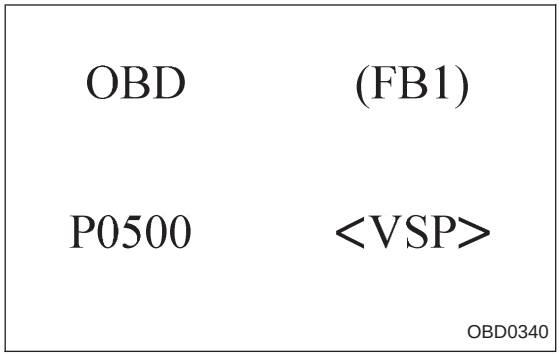
CHECK ***: Connector & terminal***
(B84) No. 27 (+) — Chassis ground:
Is the voltage less than 1 V?

YES : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between ECM connector and junction A on rear wiring harness
- Poor contact in coupling connector (B97)

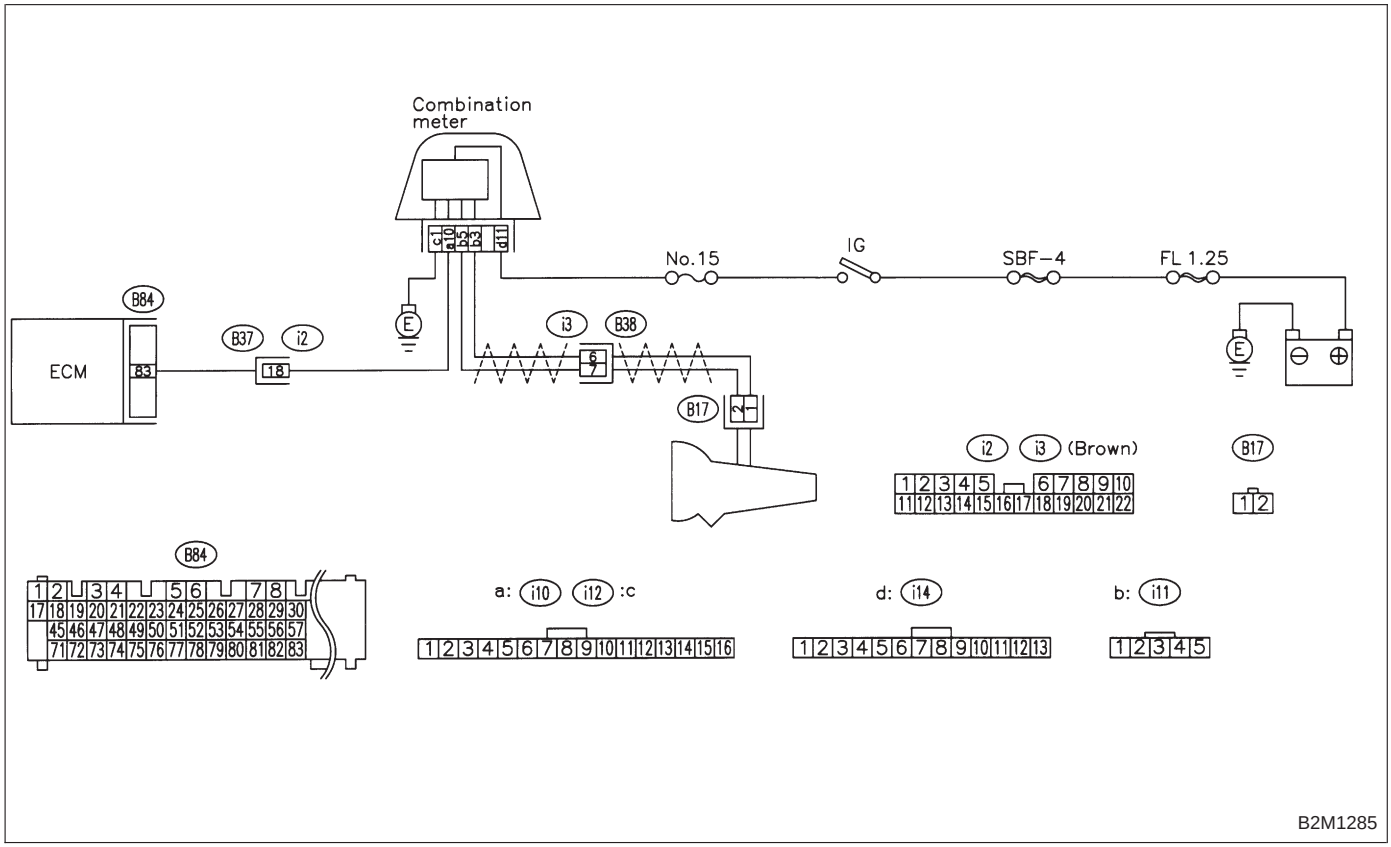
NO : Repair connector.

NOTE:
In this case, repair the following:
- Poor contact in fuel pump connector
- Poor contact in fuel sub meter unit
- Poor contact in ECM connector



BB: DTC P0500 — VEHICLE SPEED SENSOR MALFUNCTION —

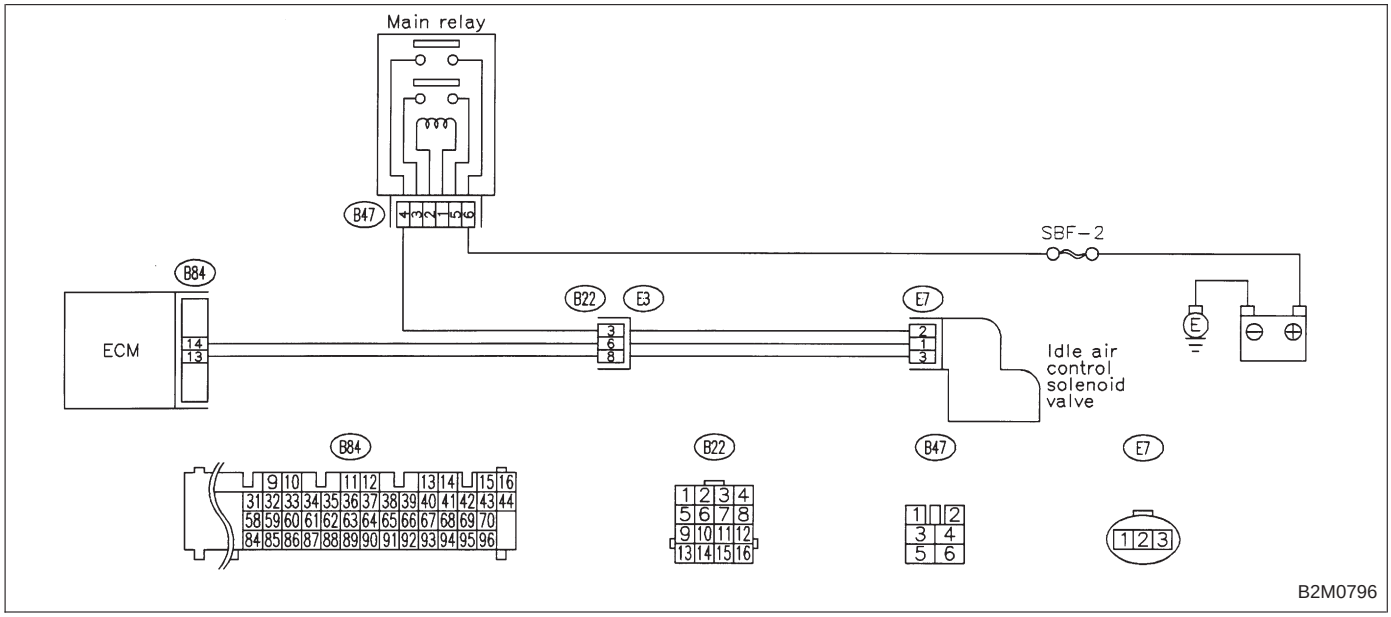
WIRING DIAGRAM:



NOTE:
Check vehicle speed sensor 2 circuit.
<Ref. to 2-7 [T10BB0].>

BC: DTC P0505 — IDLE CONTROL SYSTEM MALFUNCTION —

WIRING DIAGRAM:



NOTE:
Check idle air control solenoid valve circuit.
<Ref. to 2-7 [T10BC0].>

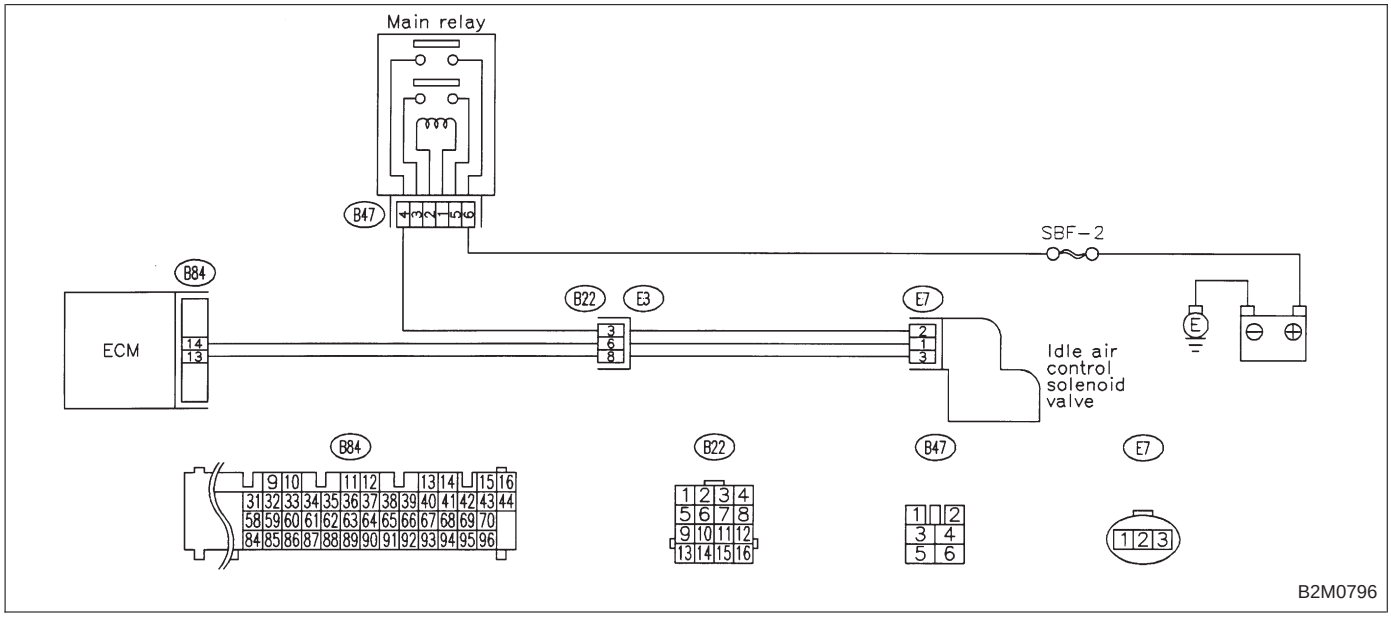
OBD (FB1)

P0506 <ISC_RLOW>

B2M1104

BD: DTC P0506 — IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED —

WIRING DIAGRAM:



NOTE:
Check idle air control system.
<Ref. to 2-7 [T10BD0].>

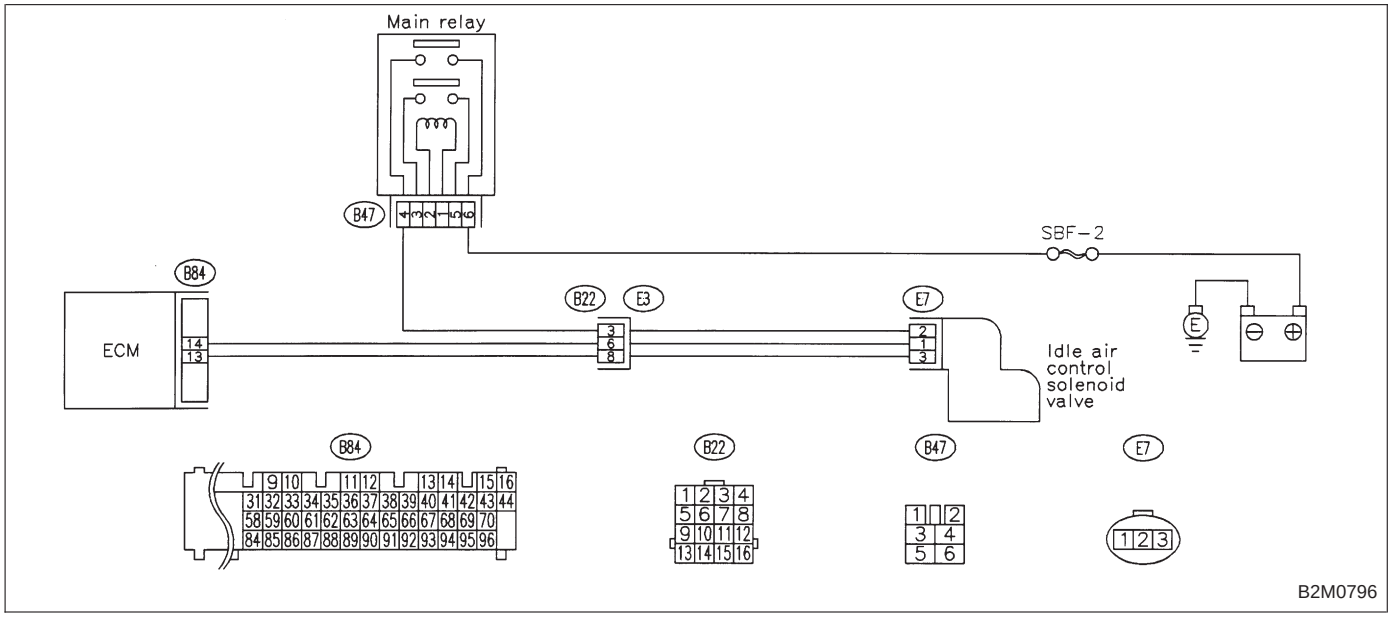
OBD (FB1)

P0507 <ISC_RHI>

B2M1105

BE: DTC P0507 — IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED —

WIRING DIAGRAM:

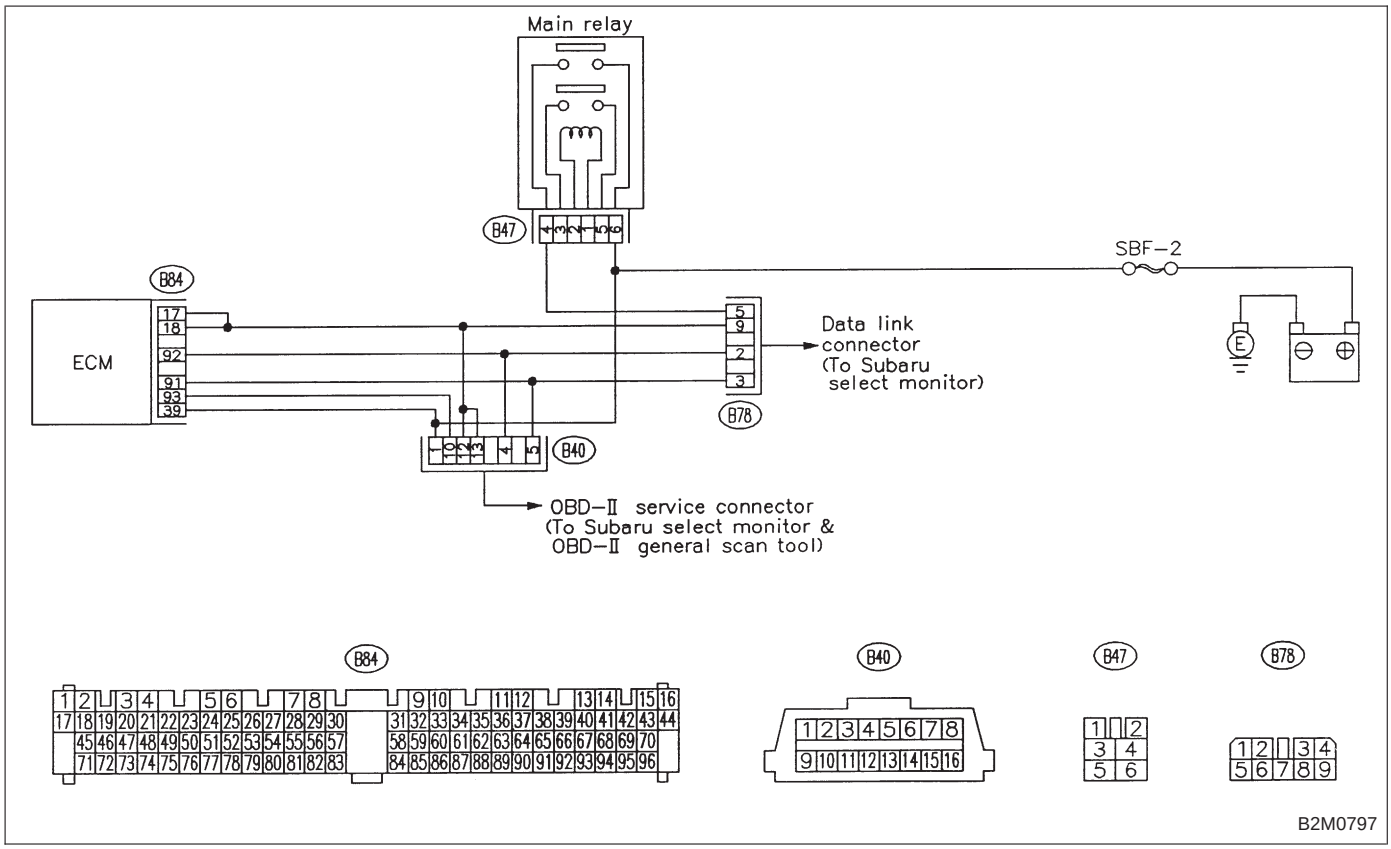


B2M0796

NOTE:
Check idle air control system.
<Ref. to 2-7 [T10BE0].>

BF: DTC P0600 — SERIAL COMMUNICATION LINK MALFUNCTION —

WIRING DIAGRAM:



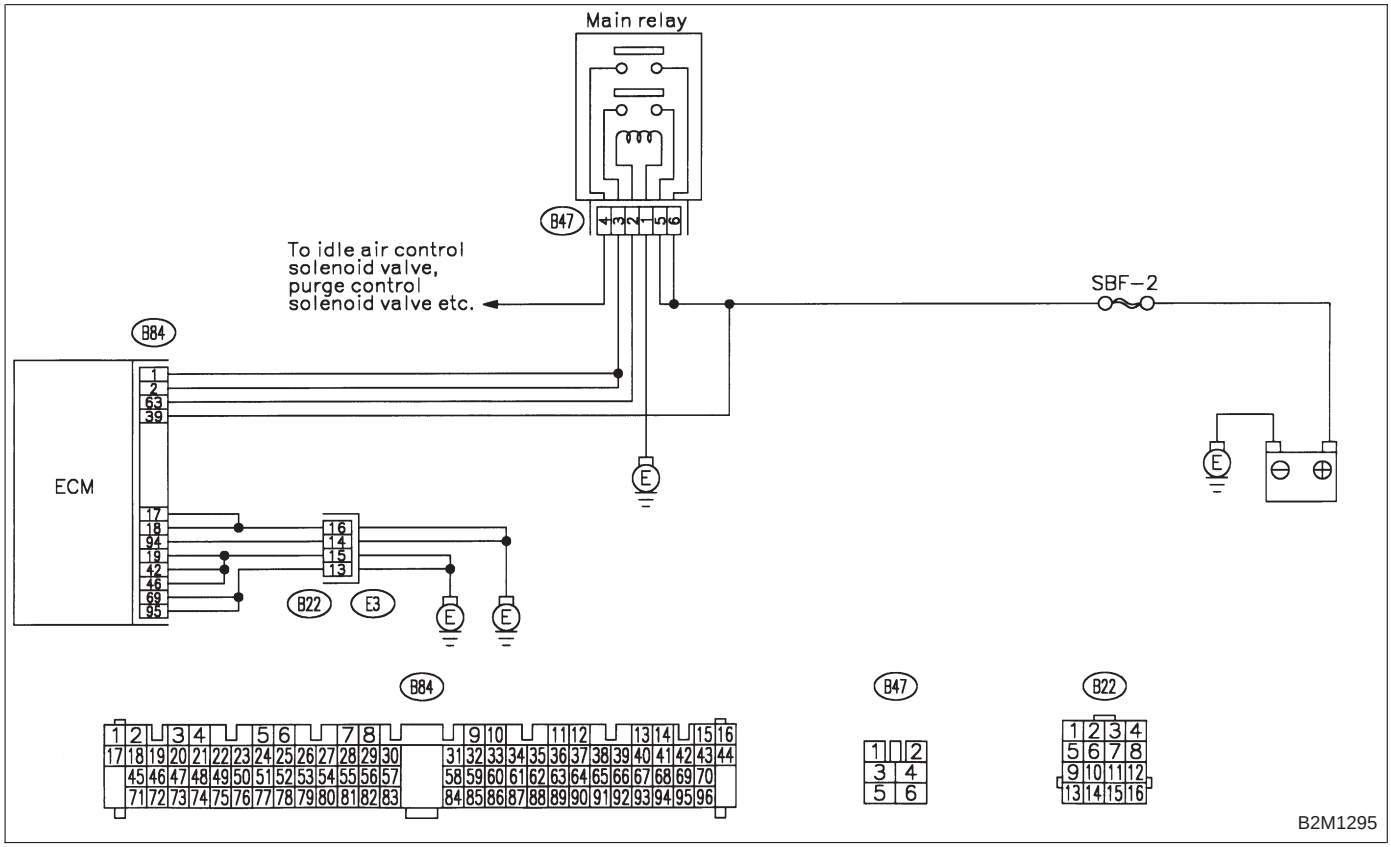
NOTE:
Check serial communication circuit.
<Ref. to 2-7 [T10BF0].>

OBD	(FB1)
P0601	<RAM>

OBD0376

BG: DTC P0601 — INTERNAL CONTROL MODULE MEMORY CHECK SUM ERROR —

WIRING DIAGRAM:

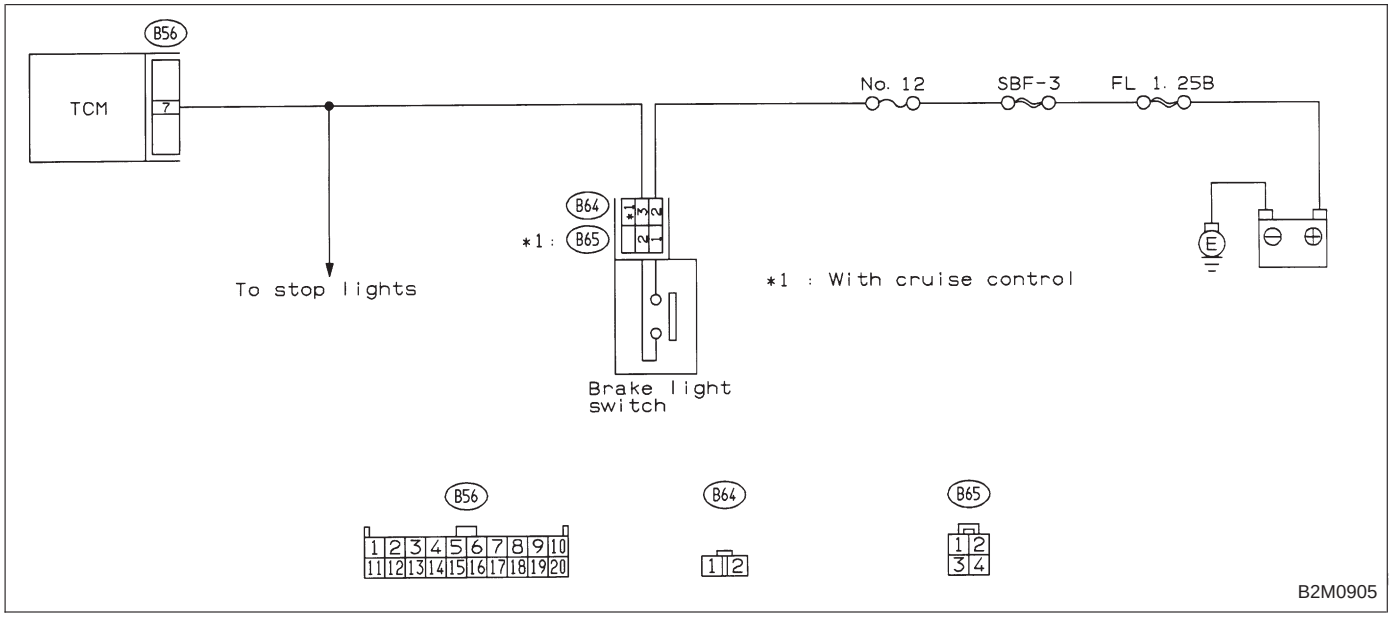


NOTE:
Check internal control module memory.
<Ref. to 2-7 [T10BG0].>

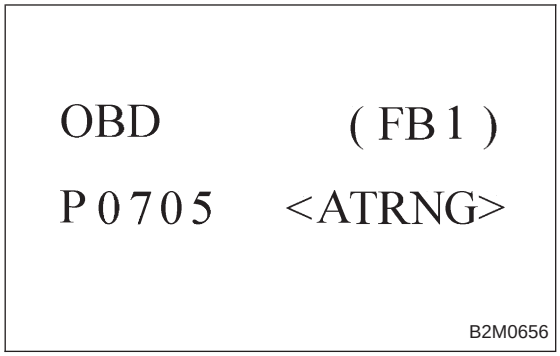
OBD (FB1)
P0703 <ATBRK>
B2M0655

BH: DTC P0703
— BRAKE SWITCH INPUT MALFUNCTION —

WIRING DIAGRAM:

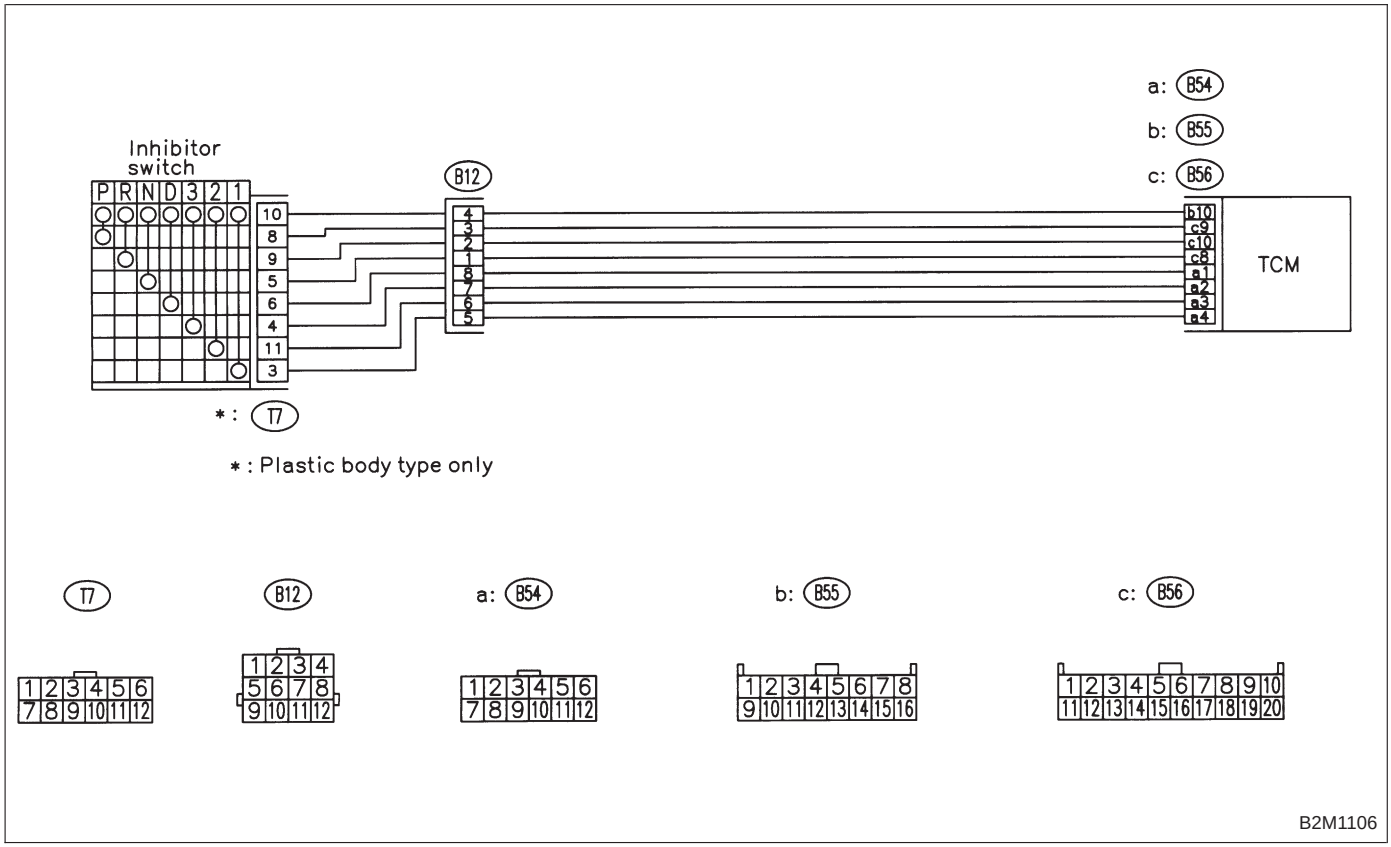


NOTE:
Check brake switch input signal circuit.
<Ref. to 2-7 [T10BH0].>



BI: DTC P0705 — TRANSMISSION RANGE SENSOR CIRCUIT MALFUNCTION —

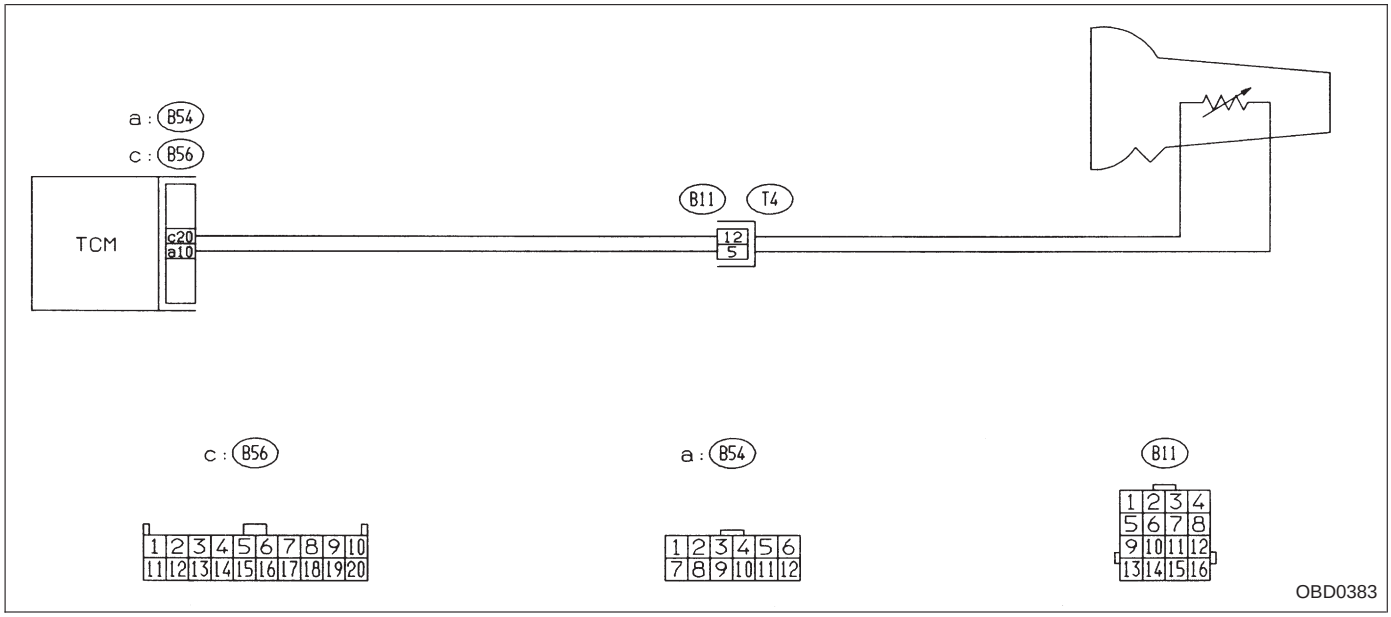
WIRING DIAGRAM:



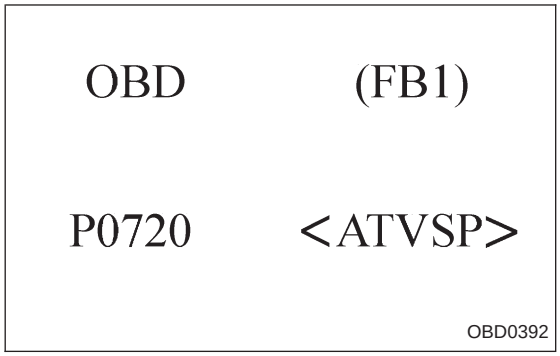
NOTE:
Check inhibitor switch circuit.
<Ref. to 2-7 [T10BI0].>

BJ: DTC P0710 — TRANSMISSION FLUID TEMPERATURE SENSOR CIRCUIT MALFUNCTION —

WIRING DIAGRAM:

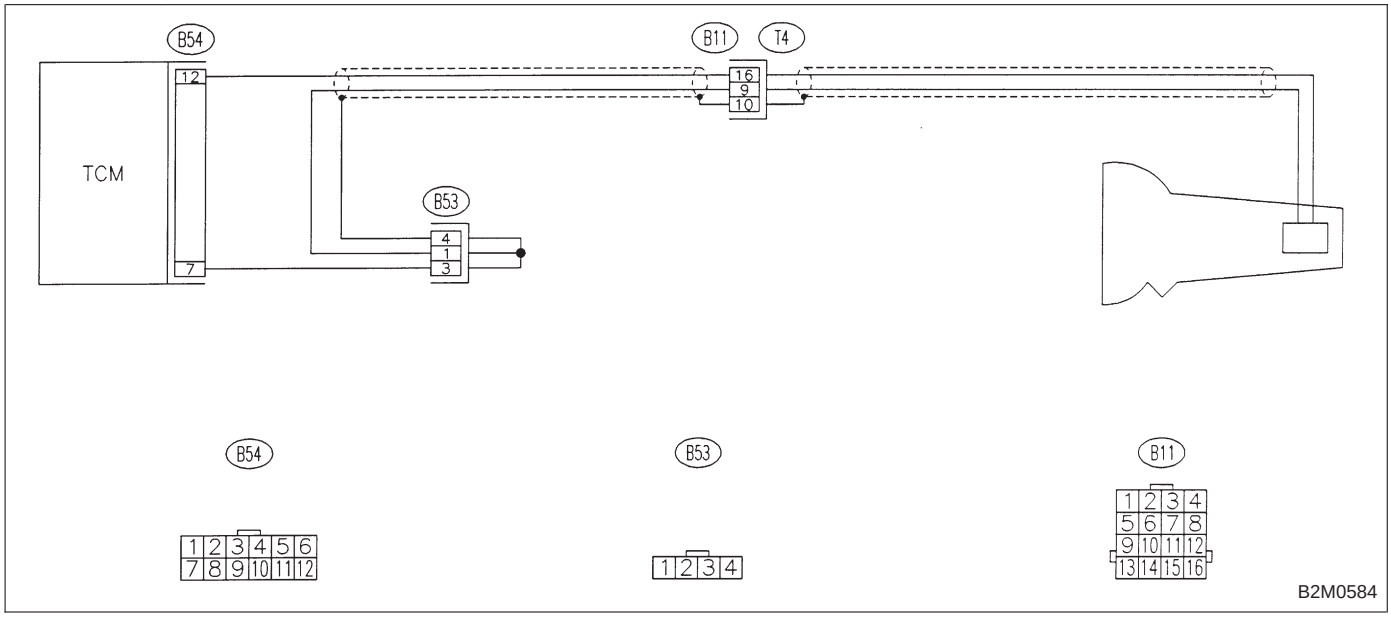


NOTE:
Check automatic transmission fluid temperature sensor circuit.
<Ref. to 2-7 [T10BJ0].>



BK: DTC P0720 — OUTPUT SPEED SENSOR (VEHICLE SPEED SENSOR 1) CIRCUIT MALFUNCTION —

WIRING DIAGRAM:



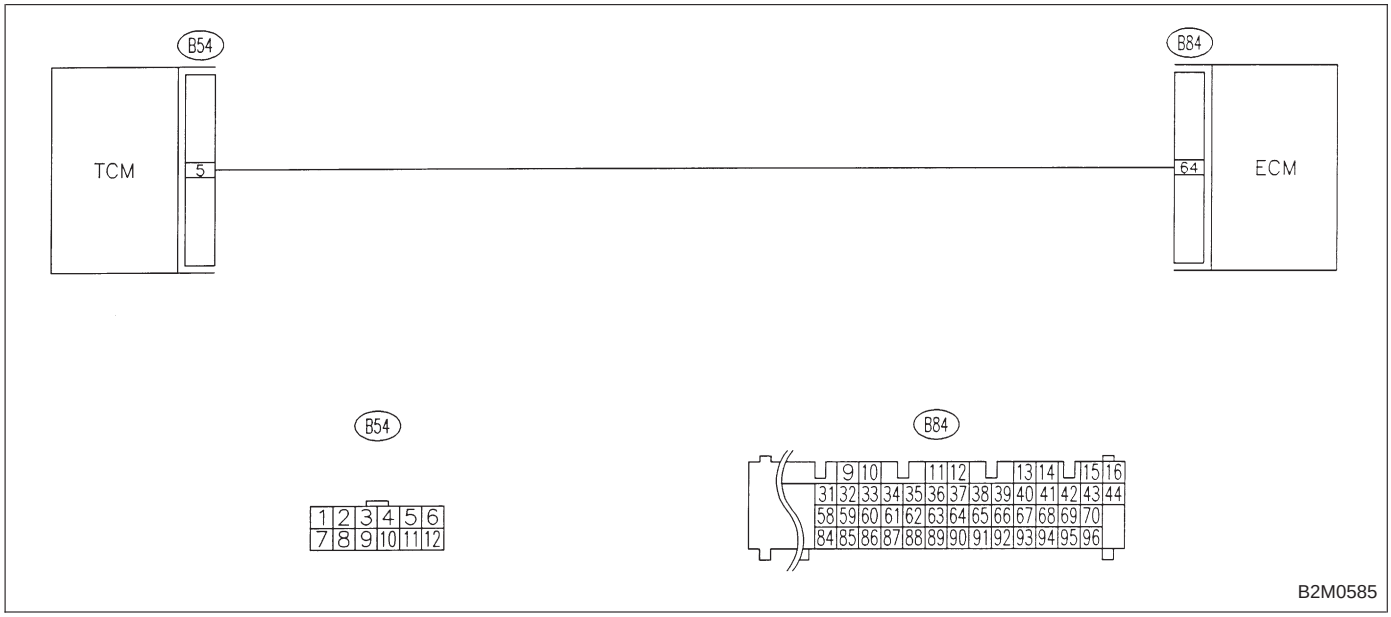
NOTE:
Check vehicle speed sensor 1 circuit.
<Ref. to 2-7 [T10BK0].>

OBD	(FB1)
P0725	<ATNE>

OBD0404

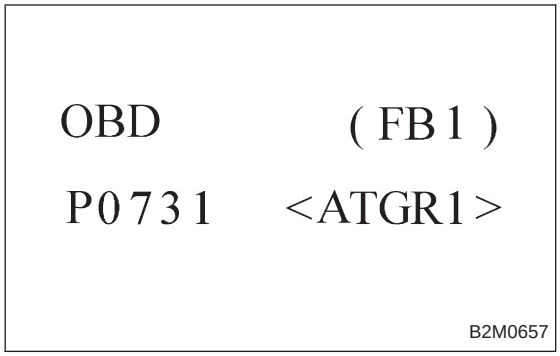
BL: DTC P0725 — ENGINE SPEED INPUT CIRCUIT MALFUNCTION —

WIRING DIAGRAM:

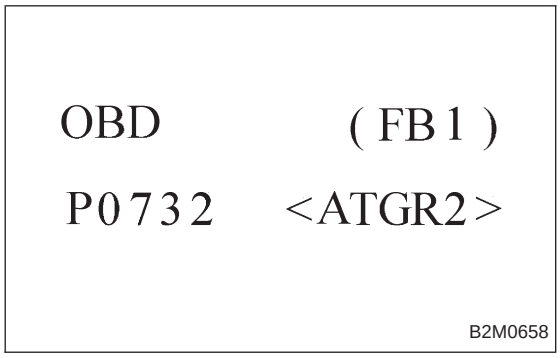


B2M0585

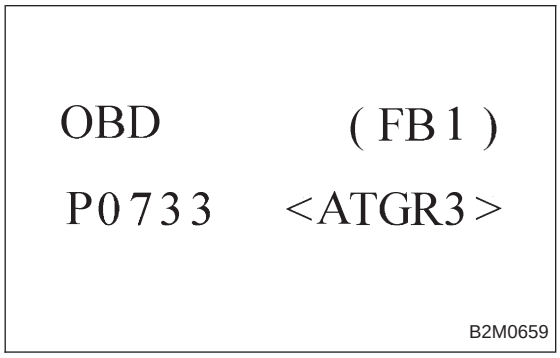
NOTE:
Check engine speed signal input circuit.
<Ref. to 2-7 [T10BL0].>



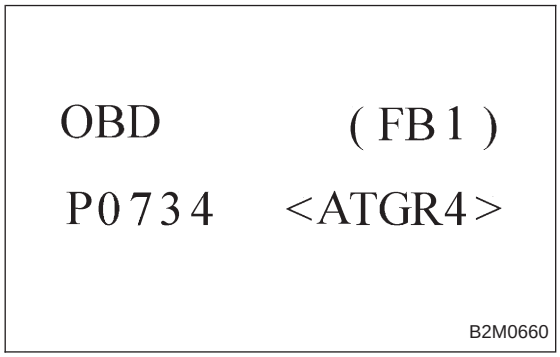
BM: DTC P0731
— GEAR 1 INCORRECT RATIO (ATGR1) —



BN: DTC P0732
— GEAR 2 INCORRECT RATIO (ATGR2) —

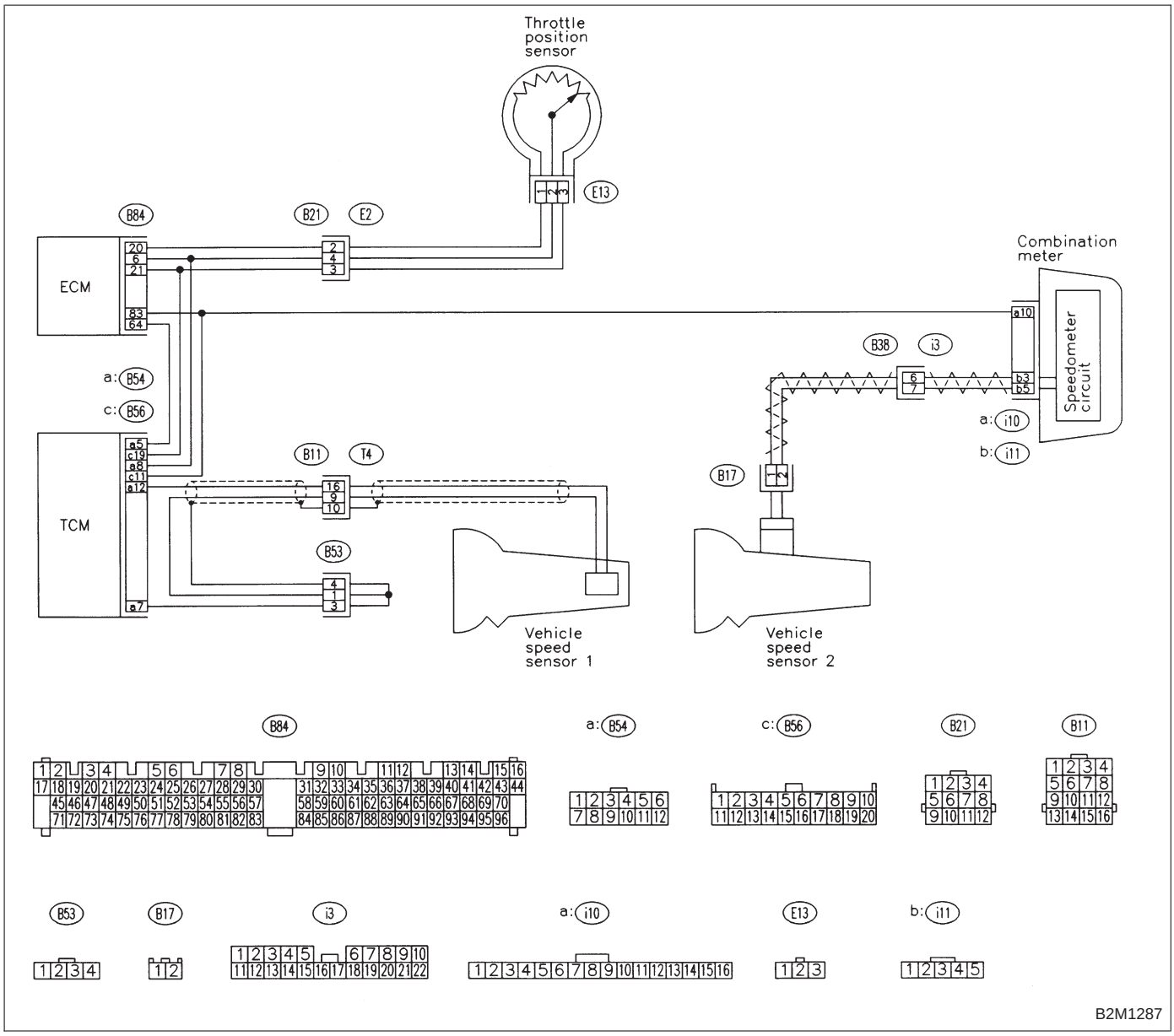


BO: DTC P0733
— GEAR 3 INCORRECT RATIO (ATGR3) —



BP: DTC P0734
— GEAR 4 INCORRECT RATIO (ATGR4) —

WIRING DIAGRAM:



NOTE:
Check shift change control system.
<Ref. to 2-7 [T10BM0].>

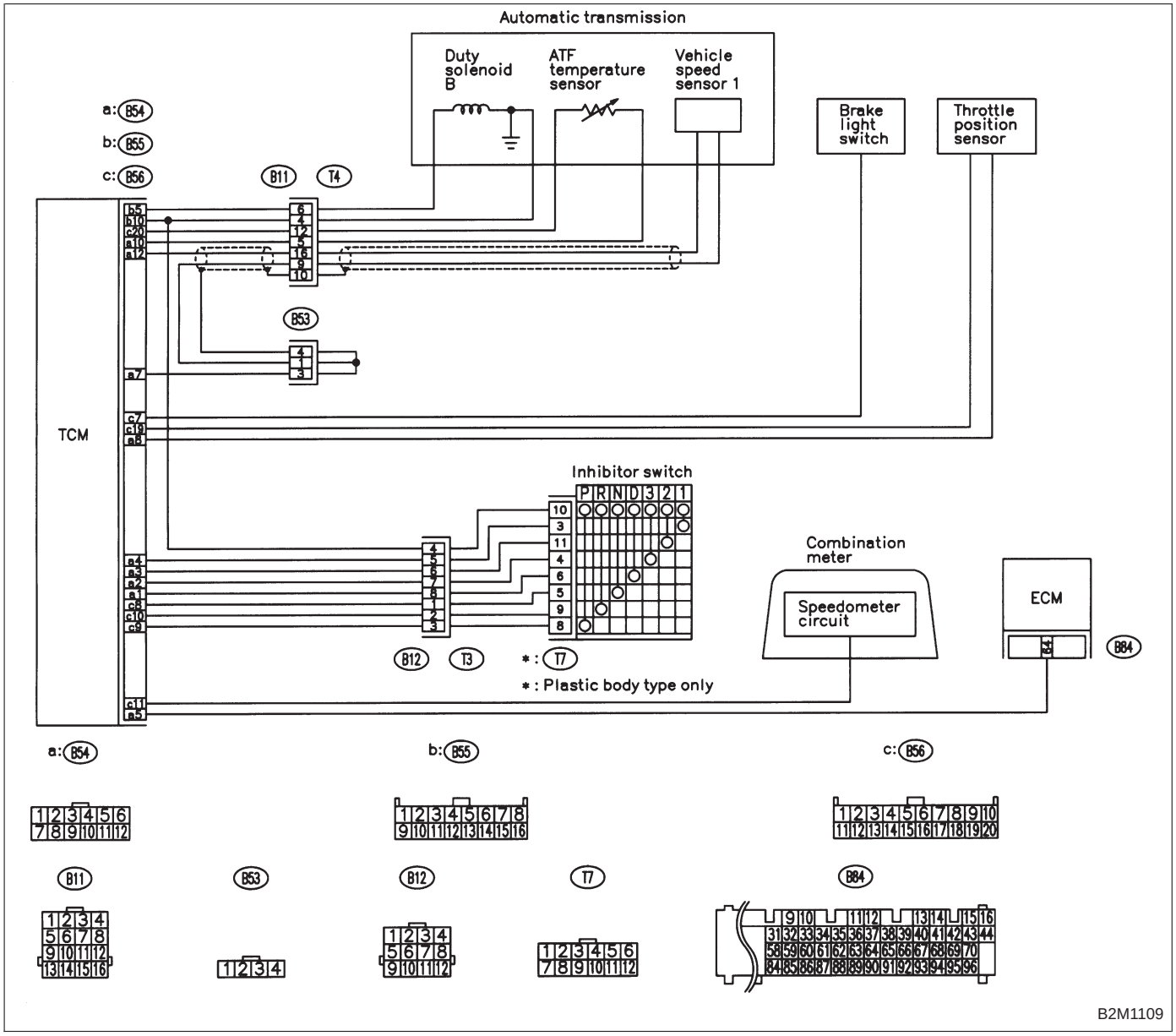
OBD (FB1)

P0740 <ATLU_F>

B2M0661

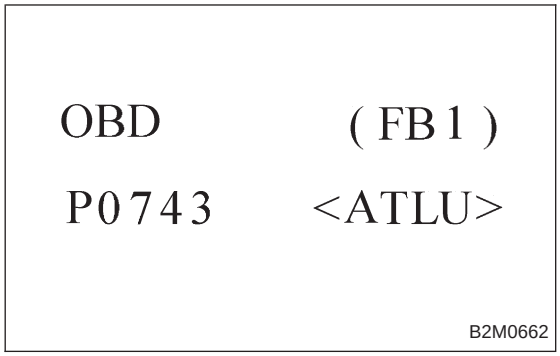
BQ: DTC P0740 — TORQUE CONVERTER CLUTCH SYSTEM MALFUNCTION —

WIRING DIAGRAM:



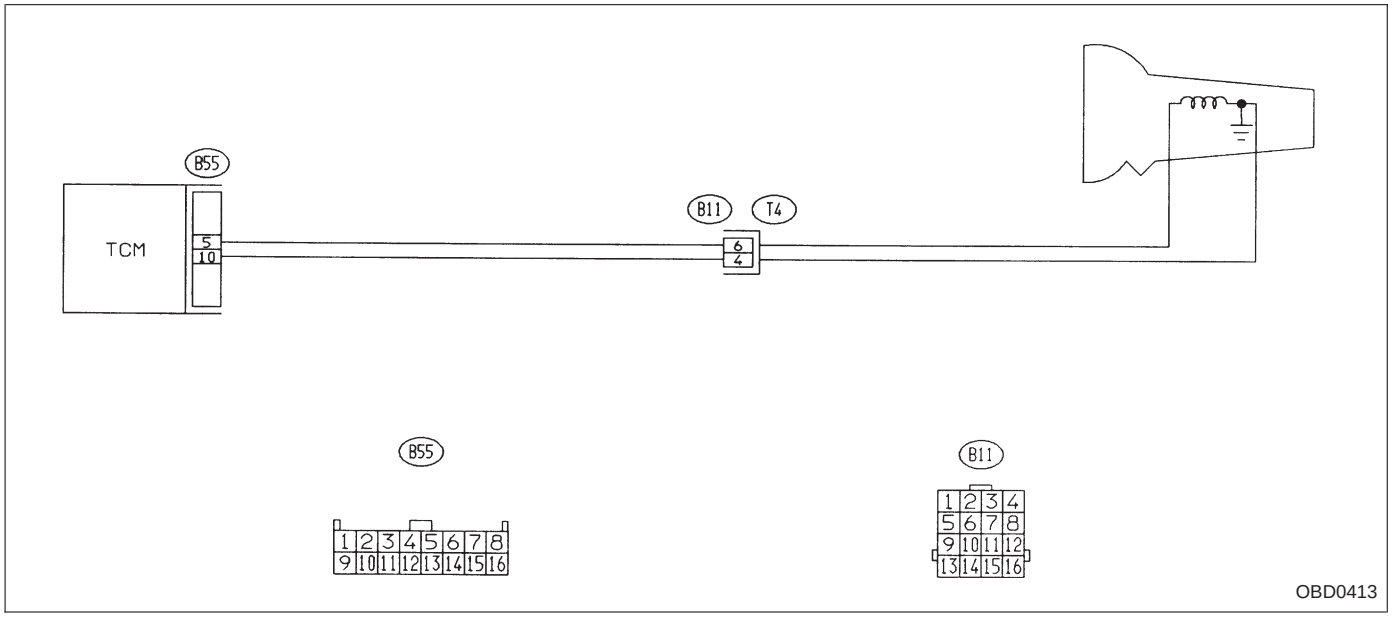
B2M1109

NOTE:
Check torque converter lock-up control system.
<Ref. to 2-7 [T10BQ0].>

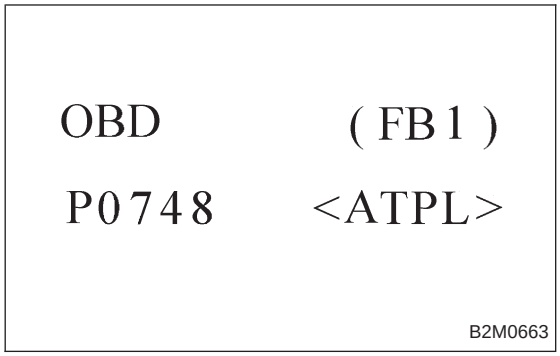


BR: DTC P0743 — TORQUE CONVERTER CLUTCH SYSTEM (DUTY SOLENOID B) ELECTRICAL —

WIRING DIAGRAM:

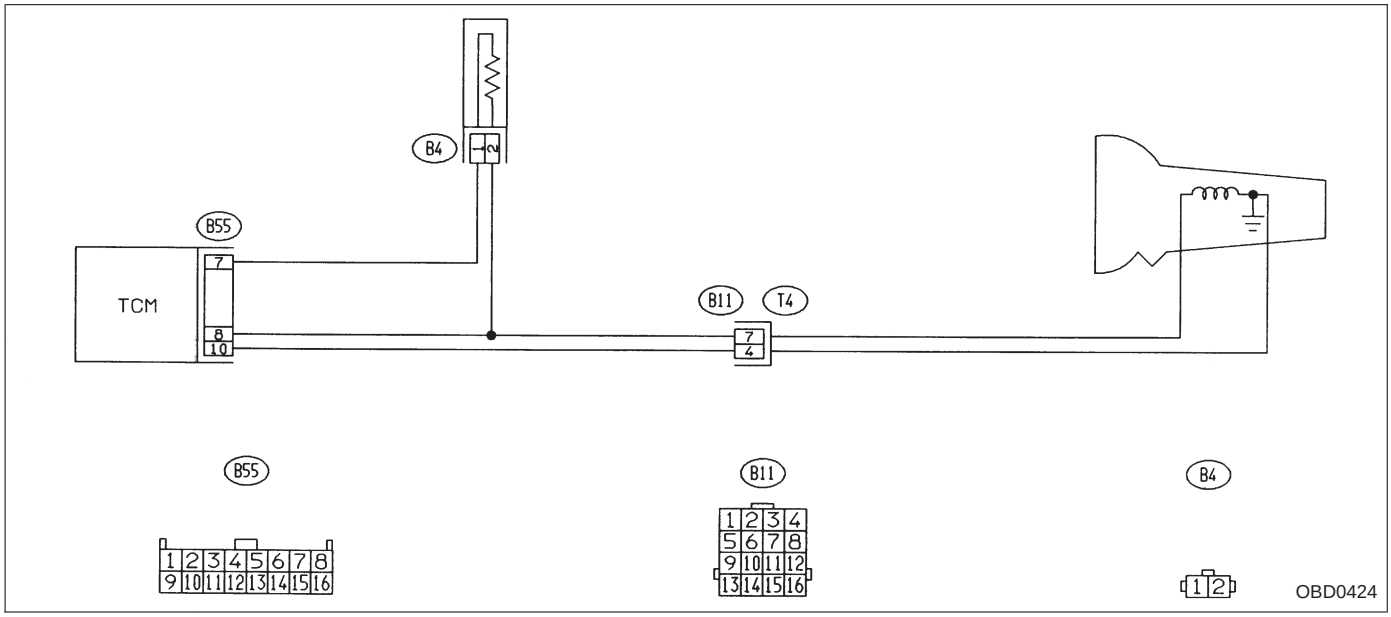


NOTE:
Check duty solenoid B circuit.
<Ref. to 2-7 [T10BR0].>

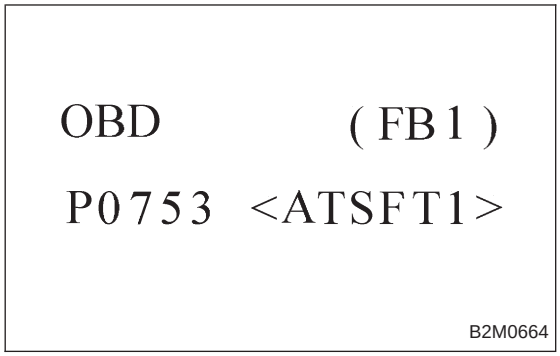


BS: DTC P0748 — PRESSURE CONTROL SOLENOID (DUTY SOLENOID A) ELECTRICAL —

WIRING DIAGRAM:

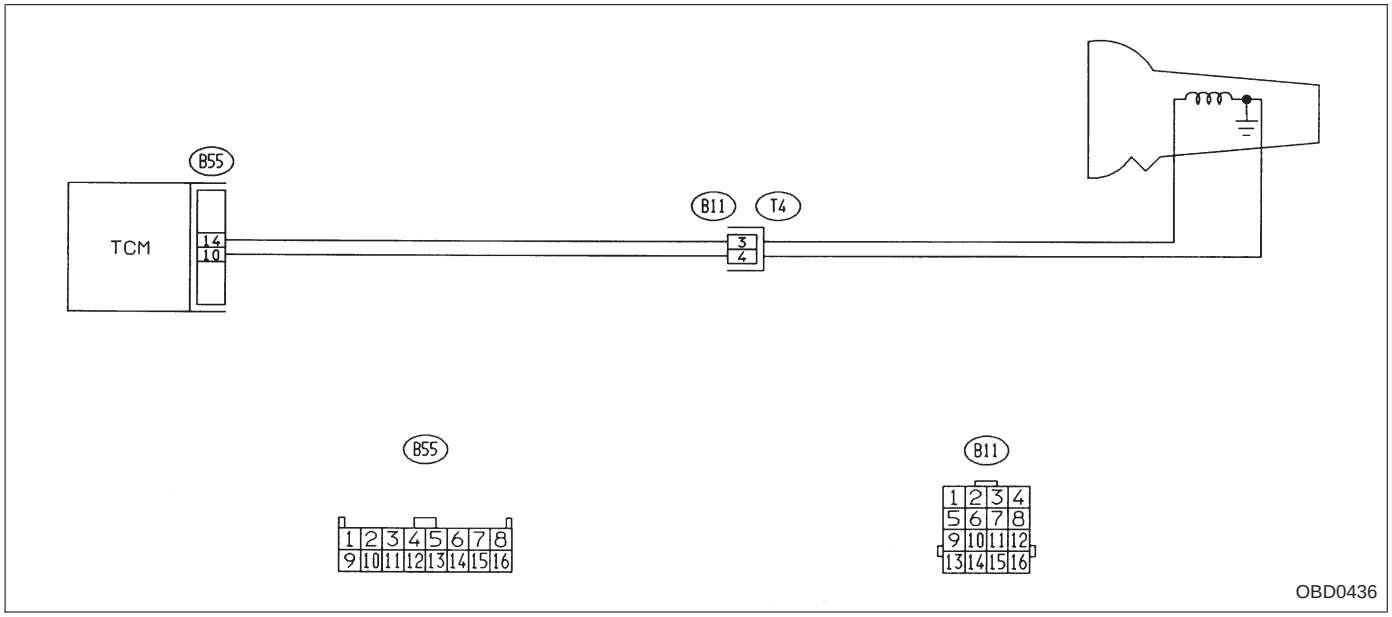


NOTE:
Check duty solenoid A circuit.
<Ref. to 2-7 [T10BS0].>

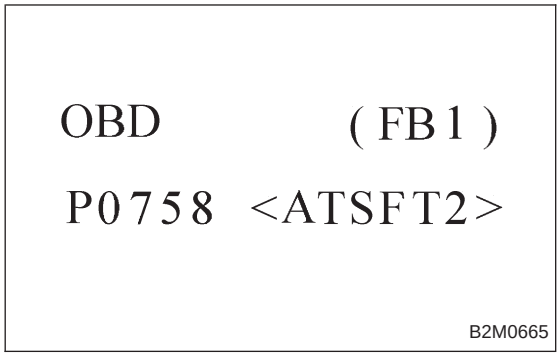


BT: DTC P0753 — SHIFT SOLENOID A (SHIFT SOLENOID 1) ELECTRICAL —

WIRING DIAGRAM:

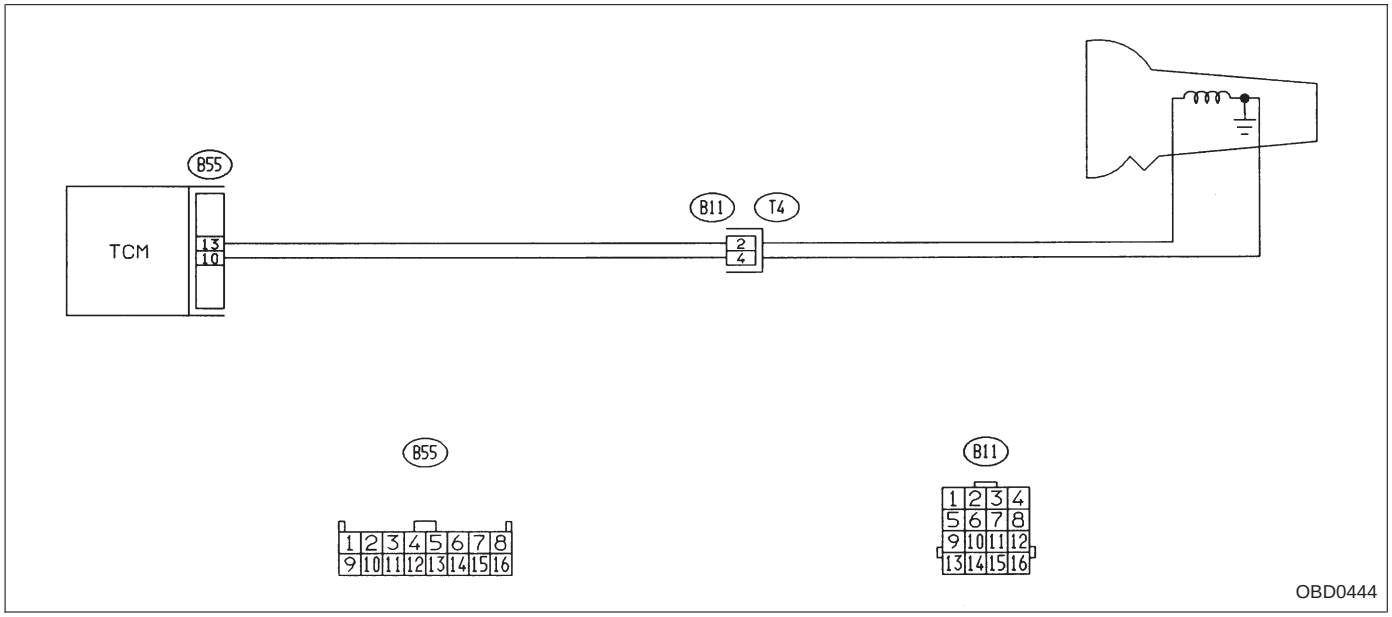


NOTE:
Check shift solenoid 1 circuit.
<Ref. to 2-7 [T10BT0].>



BU: DTC P0758 — SHIFT SOLENOID B (SHIFT SOLENOID 2) ELECTRICAL —

WIRING DIAGRAM:



NOTE:
Check shift solenoid 2 circuit.
<Ref. to 2-7 [T10BU0].>

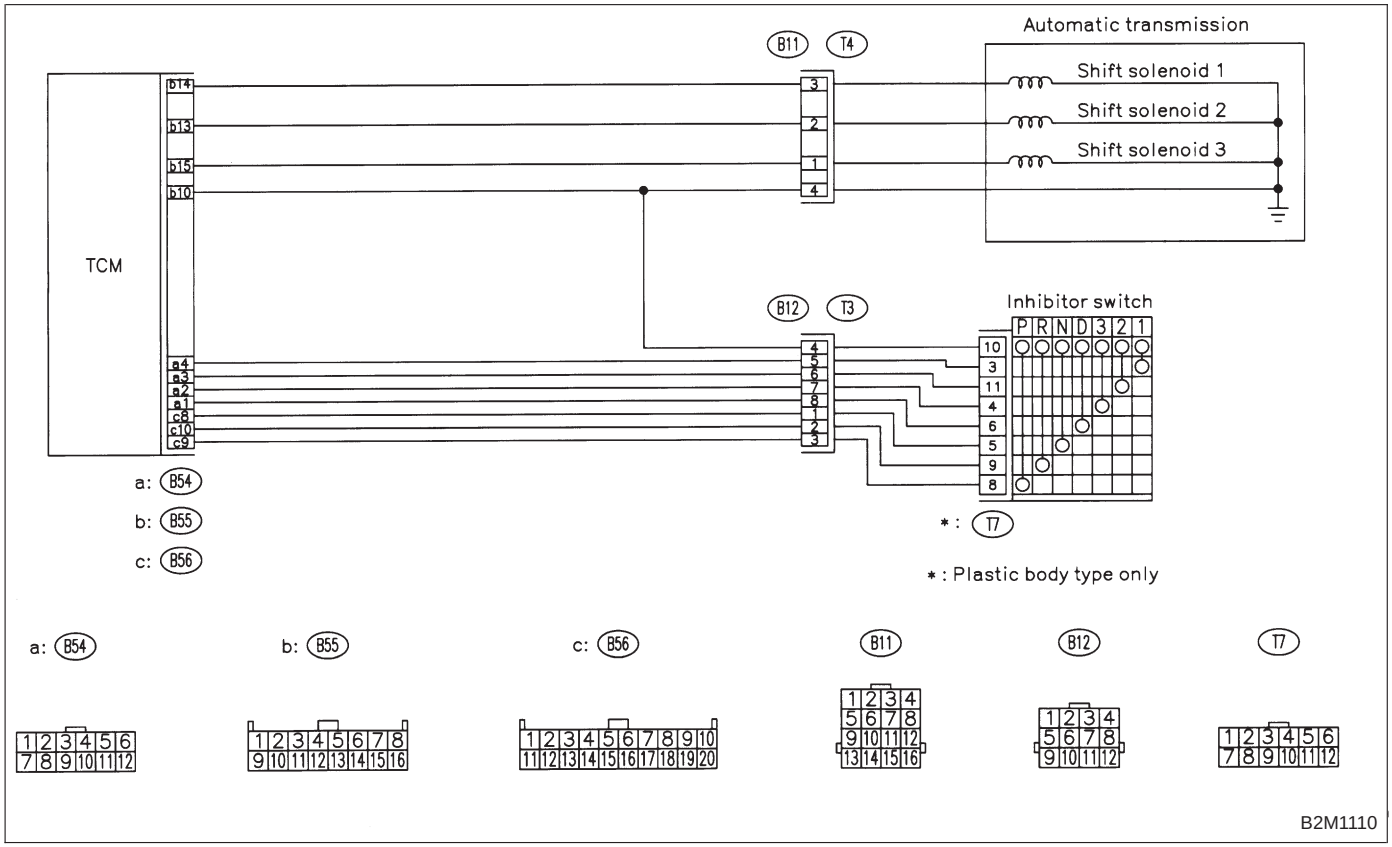
OBD (FB1)

P0760<ATOVR_F>

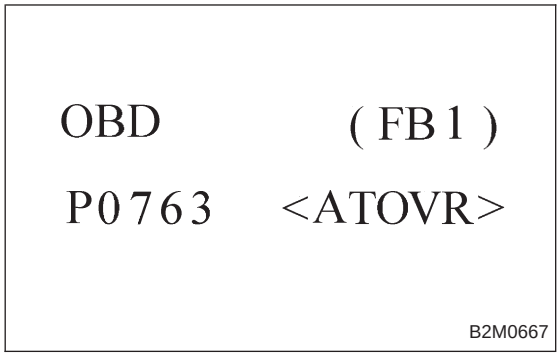
B2M0666

BV: DTC P0760 — SHIFT SOLENOID C (SHIFT SOLENOID 3) MALFUNCTION —

WIRING DIAGRAM:

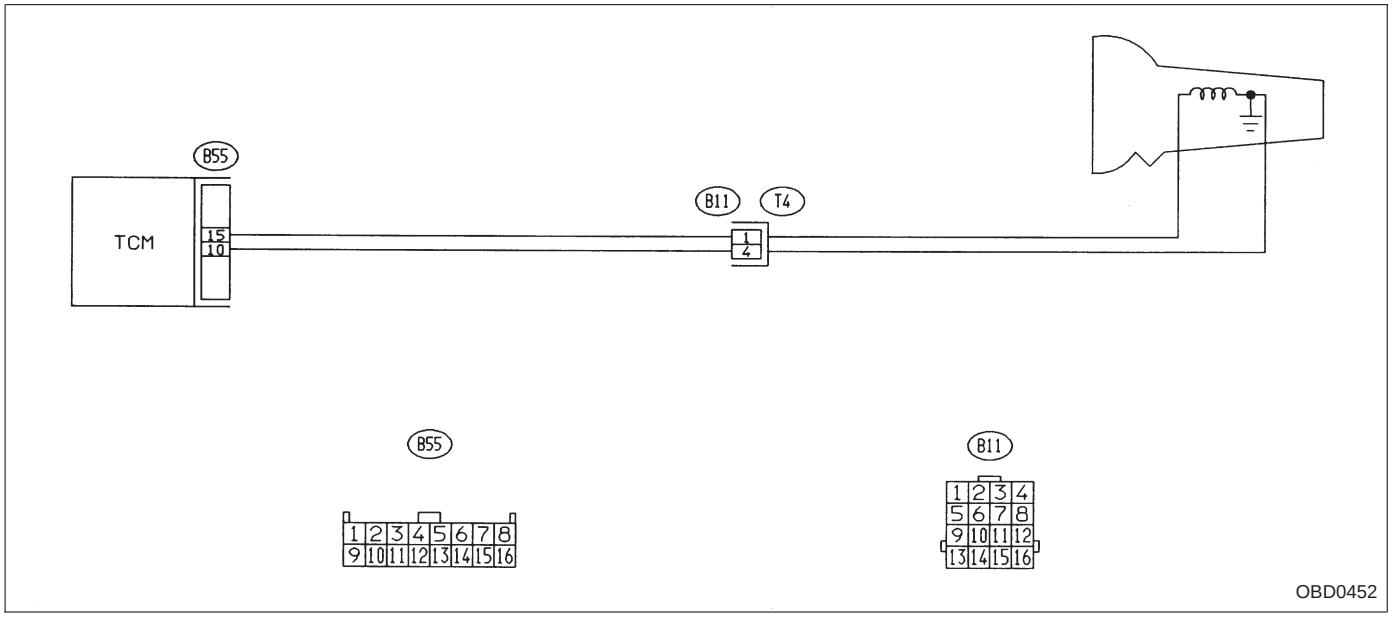


NOTE:
Check shift solenoid 3 control system.
<Ref. to 2-7 [T10BV0].>



BW: DTC P0763 — SHIFT SOLENOID C (SHIFT SOLENOID 3) ELECTRICAL —

WIRING DIAGRAM:



NOTE:
Check shift solenoid 3 circuit.
<Ref. to 2-7 [T10BW0].>

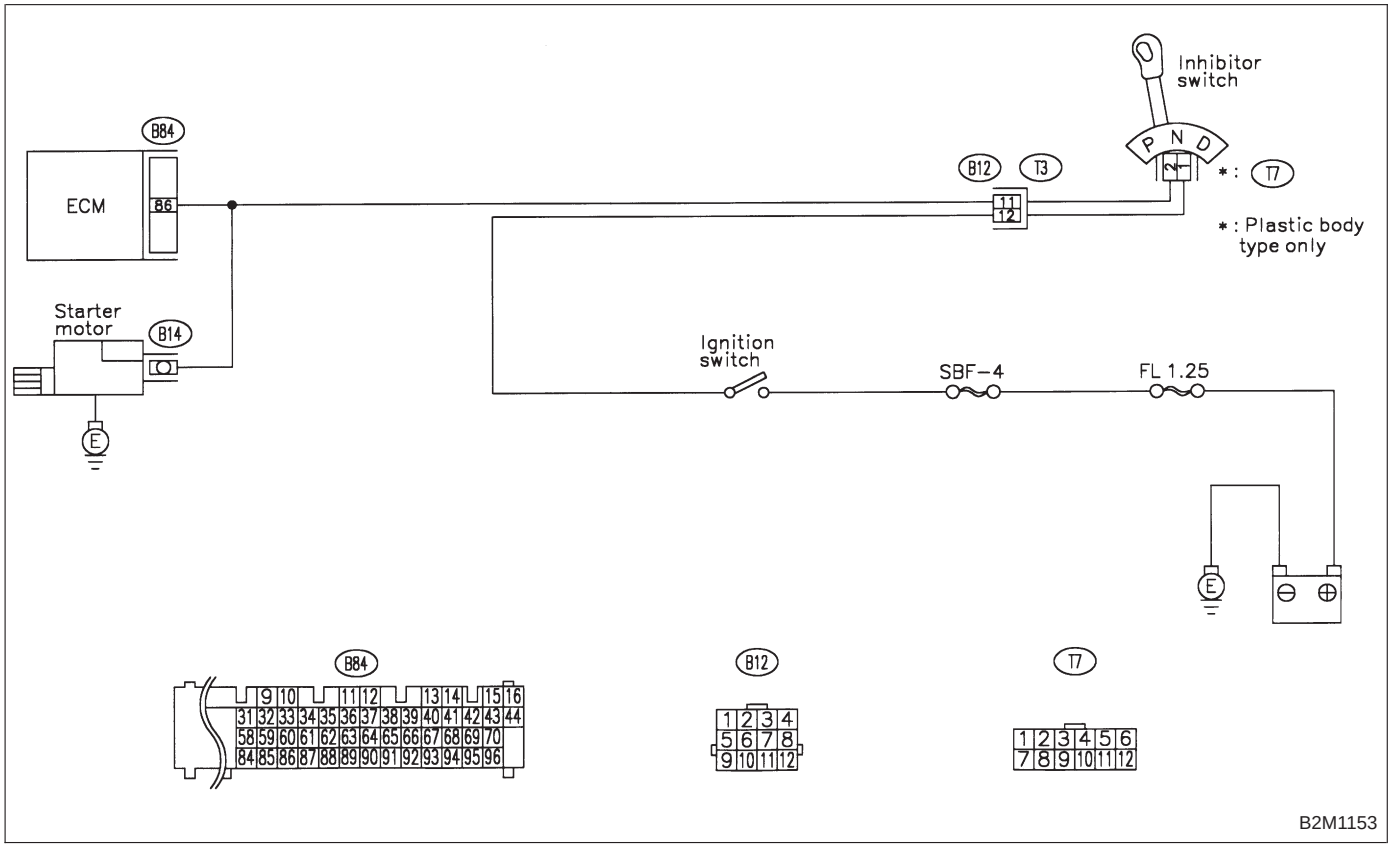
OBD (FB1)

P1100 <ST_SWOFF>

B2M1113

BX: DTC P1100
— STARTER SWITCH CIRCUIT LOW INPUT —

WIRING DIAGRAM:



B2M1153

NOTE:
Check starter switch circuit.
<Ref. to 2-7 [T10BX0].>

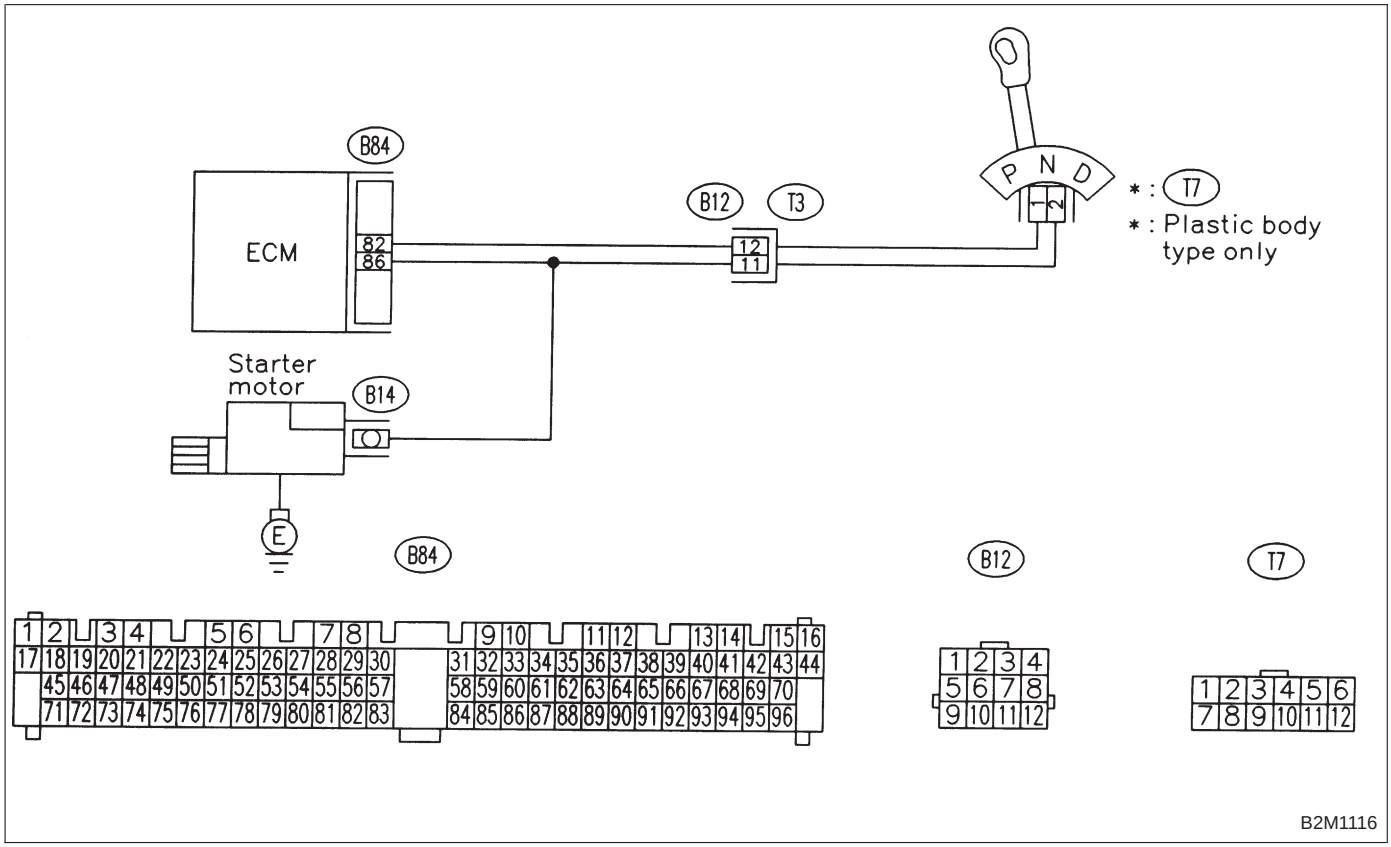
OBD (FB1)

P1101 <N_SWOFF>

B2M1115

BY: DTC P1101 — NEUTRAL POSITION SWITCH CIRCUIT HIGH INPUT [AT VEHICLES] —

WIRING DIAGRAM:



B2M1116

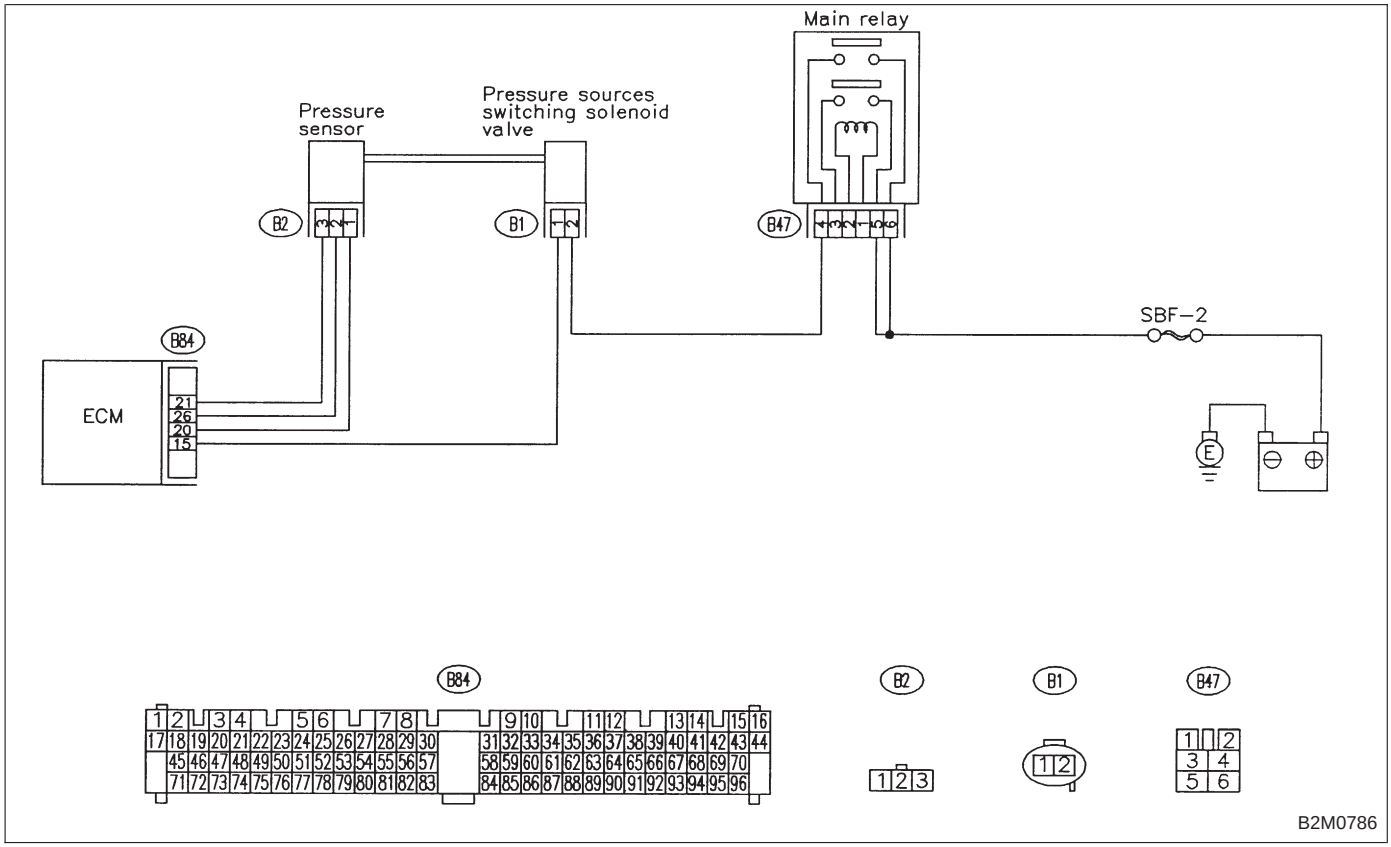
NOTE:
Check neutral position switch circuit.
<Ref. to 2-7 [T10BZ0].>

OBD	(FB1)
P1102	

OBD0481

BZ: DTC P1102 — PRESSURE SOURCES SWITCHING SOLENOID VALVE CIRCUIT LOW INPUT —

WIRING DIAGRAM:

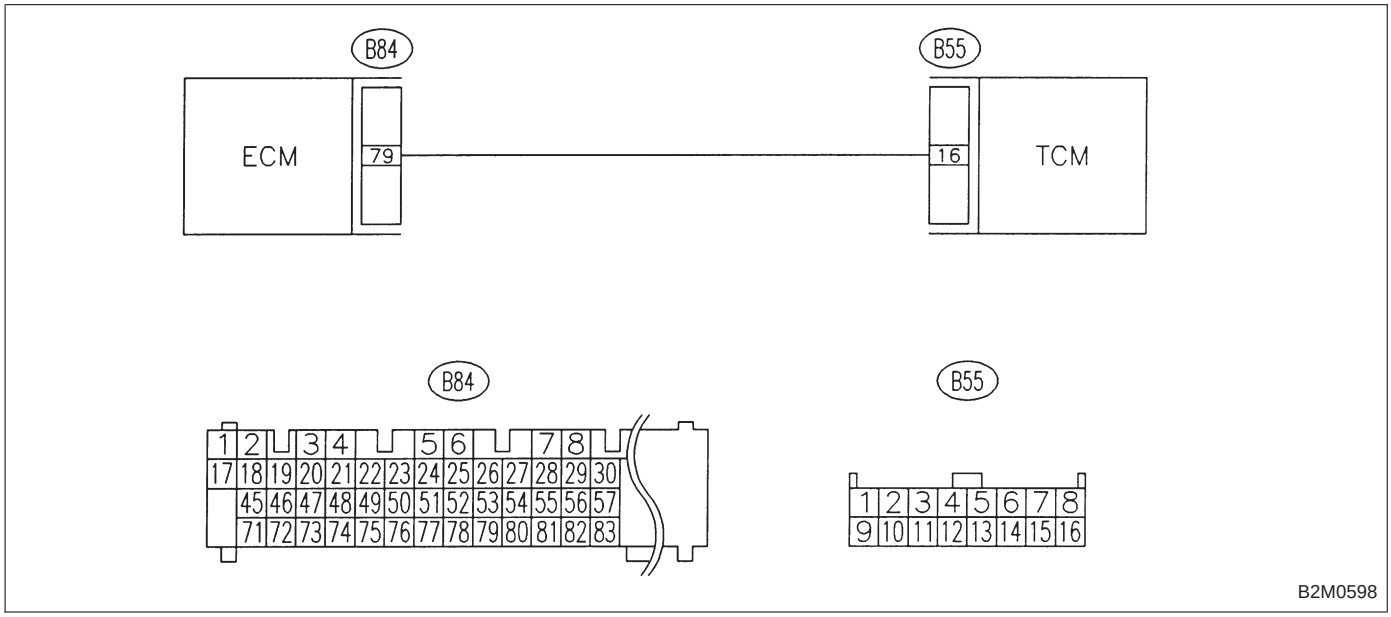


B2M0786

NOTE:
Check pressure sources switching solenoid valve circuit. <Ref. to 2-7 [T10CA0].>

CA: DTC P1103 — ENGINE TORQUE CONTROL SIGNAL CIRCUIT MALFUNCTION —

WIRING DIAGRAM:



NOTE:
Check engine torque control signal circuit.
<Ref. to 2-7 [T10CB0].>

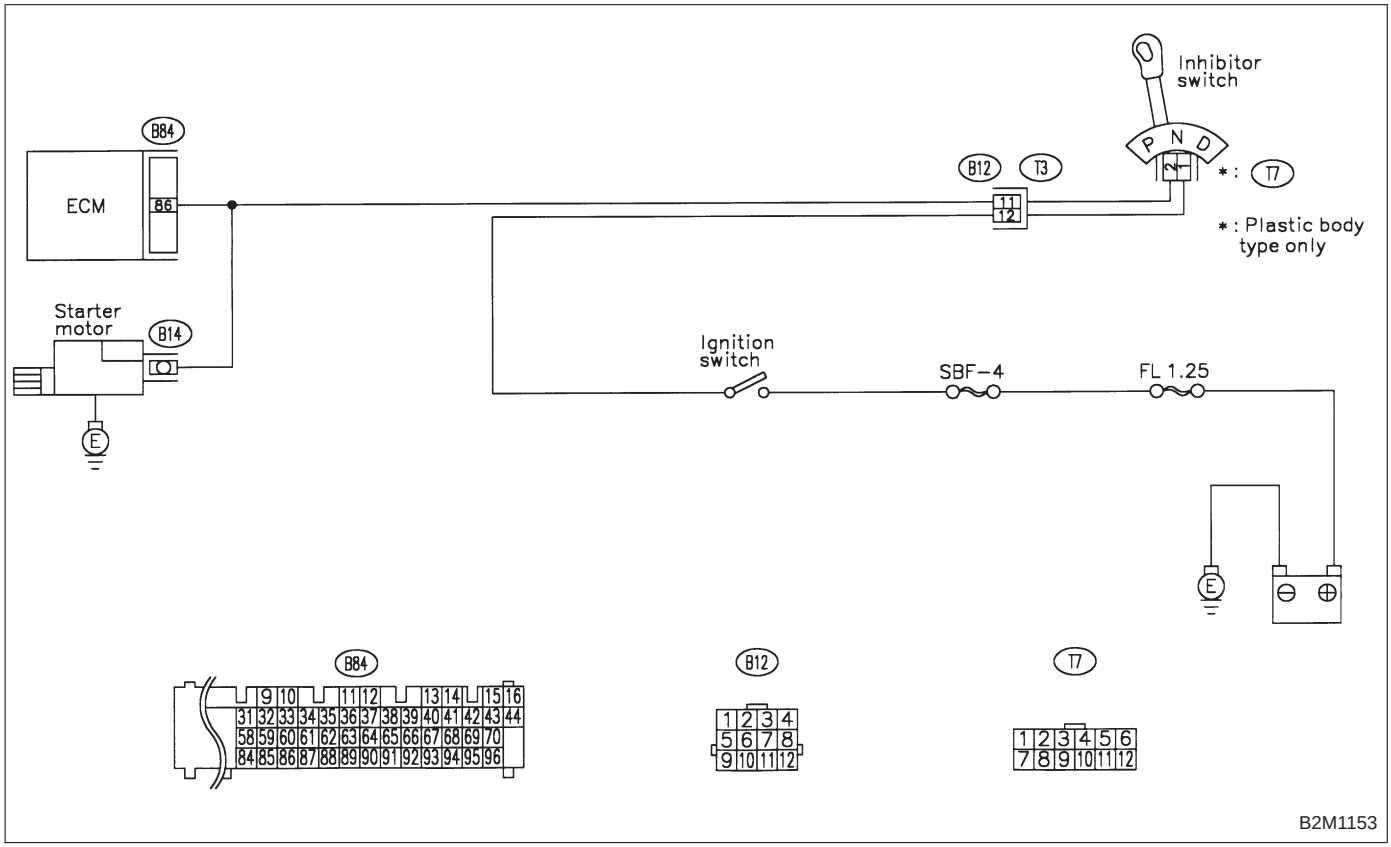
OBD (FB1)

P1120 <ST_SWON>

B2M1122

CB: DTC P1120 — STARTER SWITCH CIRCUIT HIGH INPUT —

WIRING DIAGRAM:



NOTE:
Check starter switch circuit.
<Ref. to 2-7 [T10CD0].>

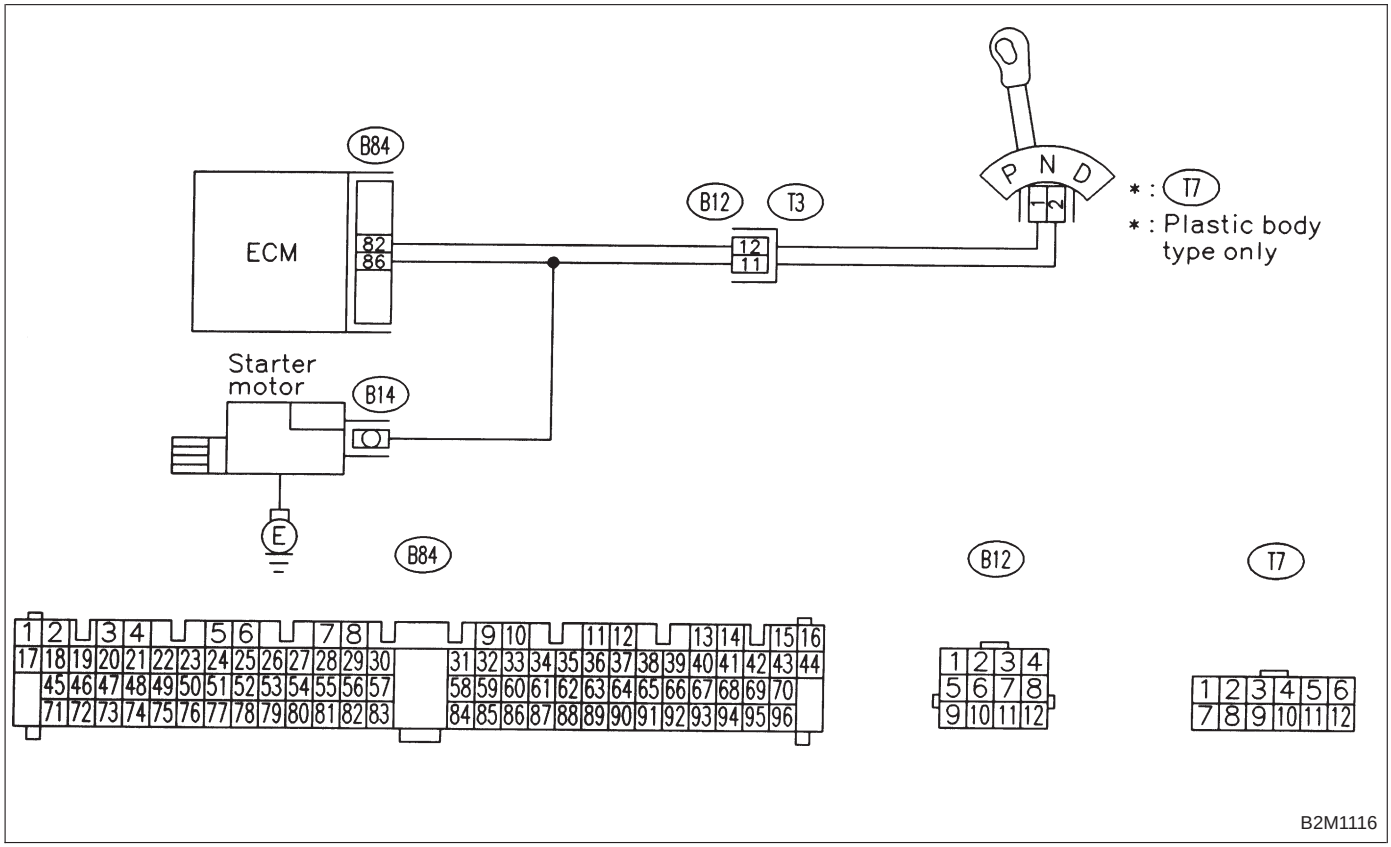
OBD (FB1)

P1121 <N_SWON>

B2M1123

CC: DTC P1121 — NEUTRAL POSITION SWITCH CIRCUIT LOW INPUT [AT VEHICLES] —

WIRING DIAGRAM:



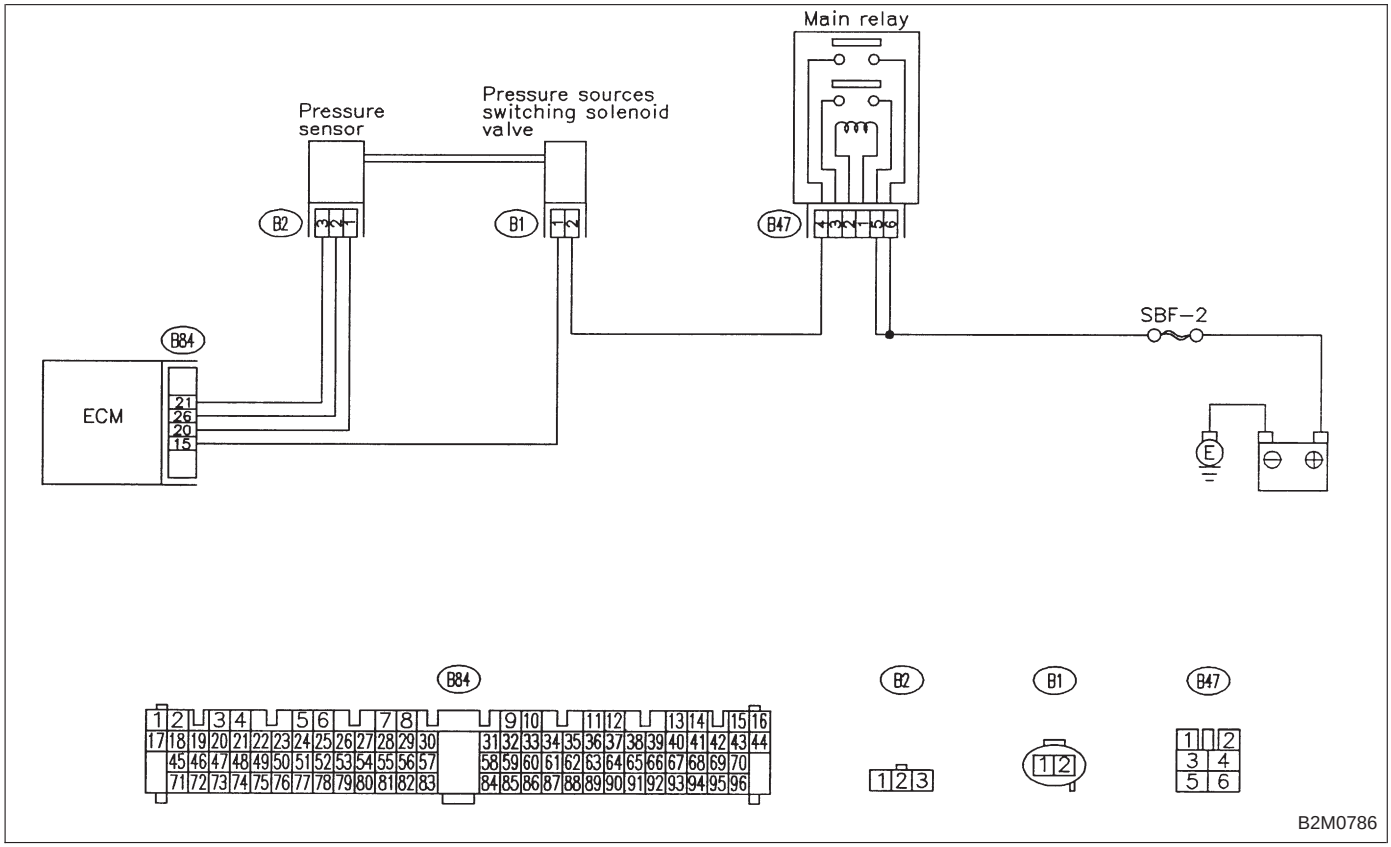
B2M1116

NOTE:
Check neutral position switch circuit.
<Ref. to 2-7 [T10CE0].>

OBD (FB1)
P1122 <BR_HI>
B2M1124

CD: DTC P1122 — PRESSURE SOURCES SWITCHING SOLENOID VALVE CIRCUIT HIGH INPUT —

WIRING DIAGRAM:

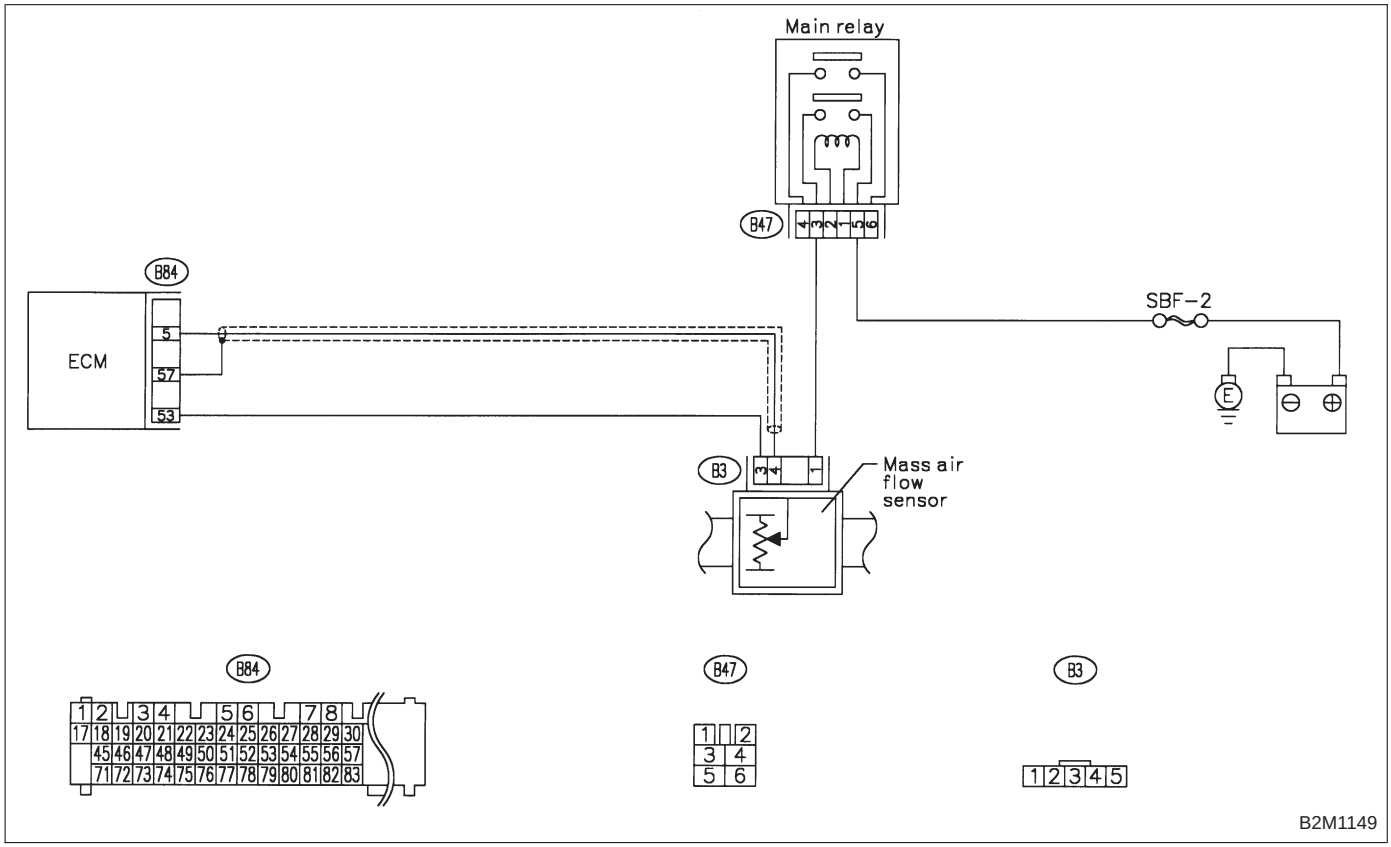


NOTE:
Check pressure sources switching solenoid valve circuit.
<Ref. to 2-7 [T10CF0].>

OBD (FB1)
P1141 <QA_RHI>
B2M1126

CE: DTC P1141 — MASS AIR FLOW SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) —

WIRING DIAGRAM:



NOTE:
Check mass air flow sensor circuit.
<Ref. to 2-7 [T10CH0].>

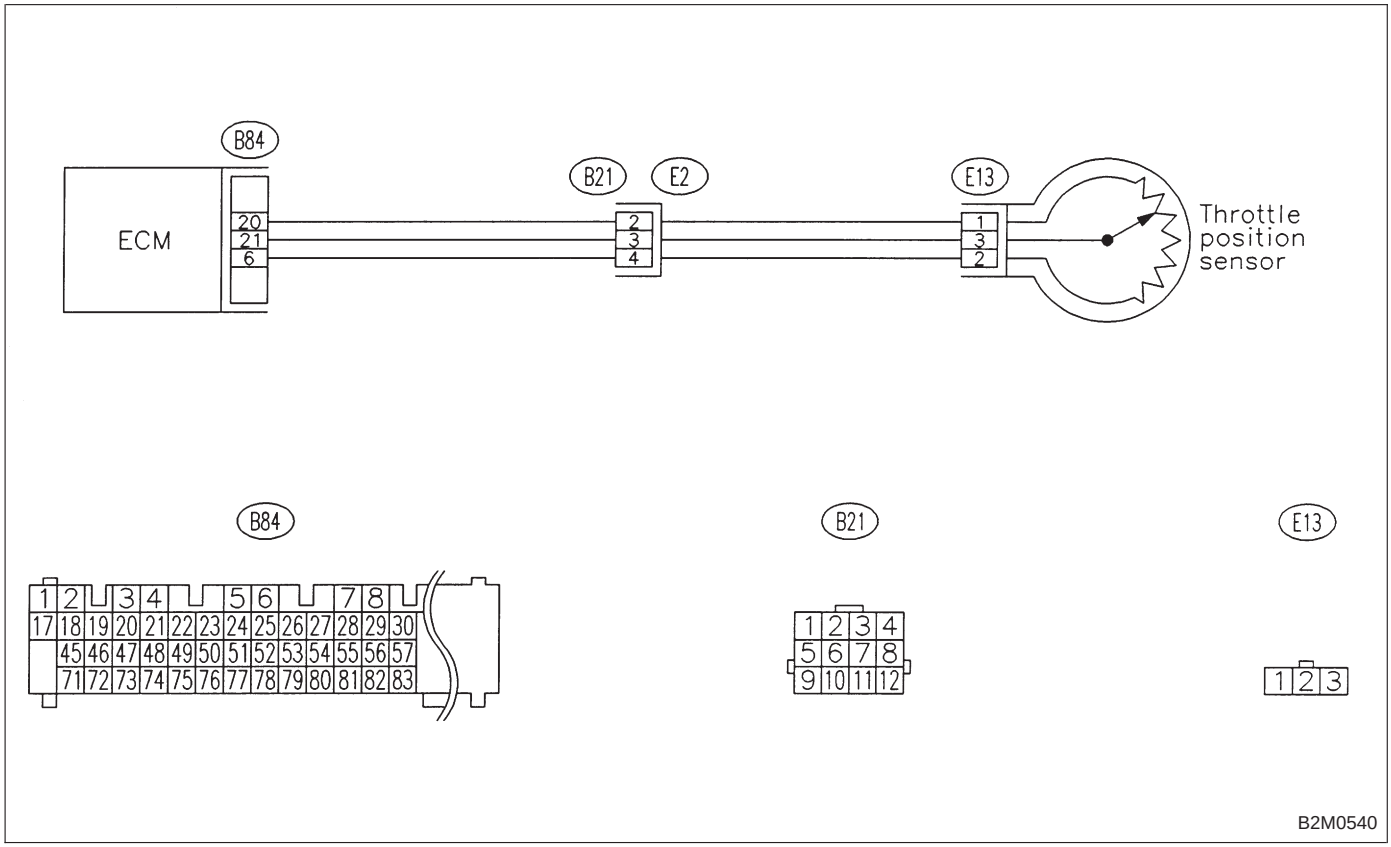
OBD (FB1)

P1142 <TH_RLOW>

B2M1127

CF: DTC P1142 — THROTTLE POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) —

WIRING DIAGRAM:



B2M0540

NOTE:
Check throttle position sensor circuit.
<Ref. to 2-7 [T10CI0].>

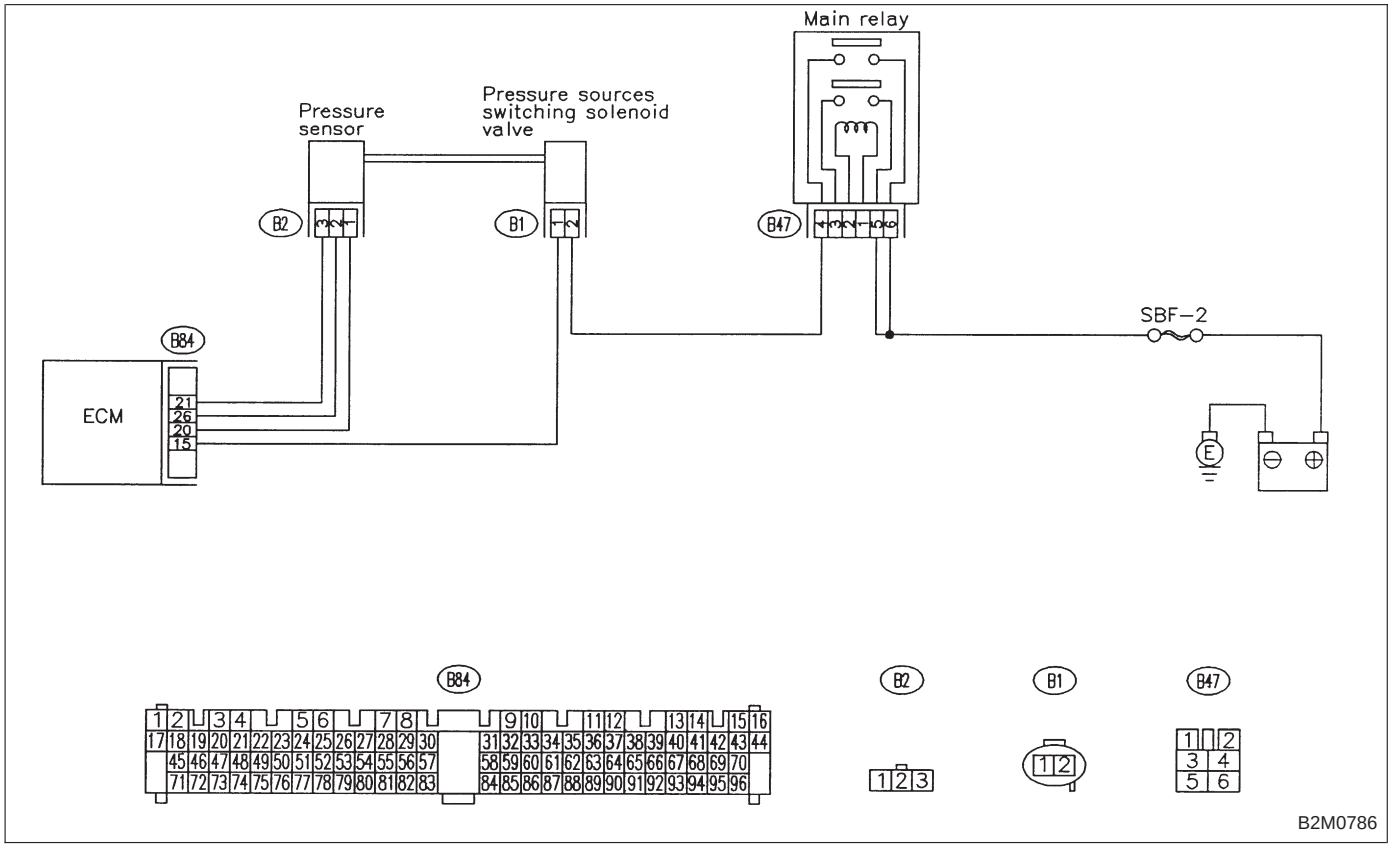
OBD (FB1)

P1143 <PS_RLOW>

B2M1128

CG: DTC P1143 — PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) —

WIRING DIAGRAM:



NOTE:
Check pressure sensor circuit.
<Ref. to 2-7 [T10CJ0].>

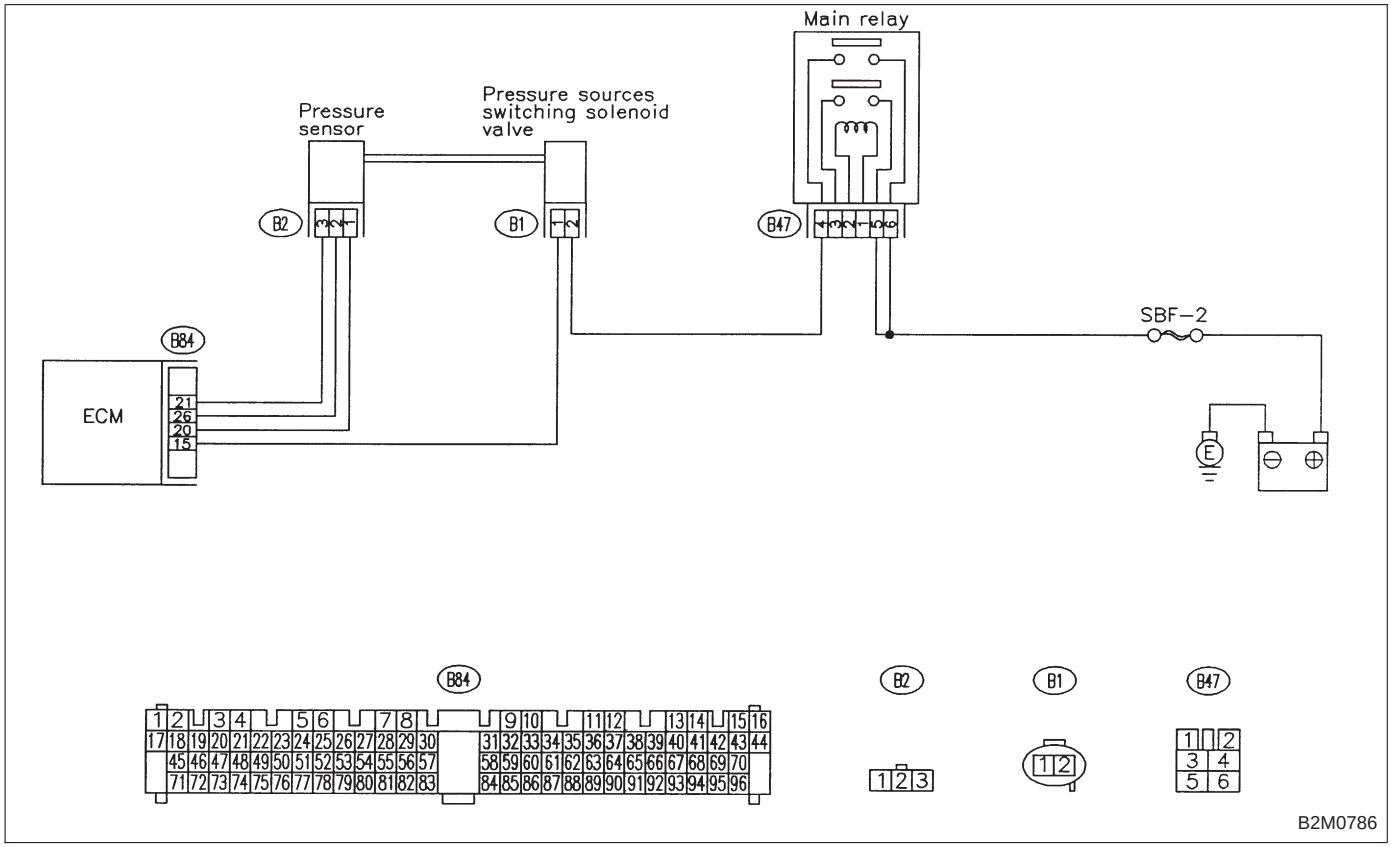
OBD (FB1)

P1144 <PS_RHI>

B2M1129

CH: DTC P1144 — PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) —

WIRING DIAGRAM:



B2M0786

NOTE:
Check pressure sensor circuit.
<Ref. to 2-7 [T10CK0].>

OBD (FB1)

P1400<PCVSOL_LO>

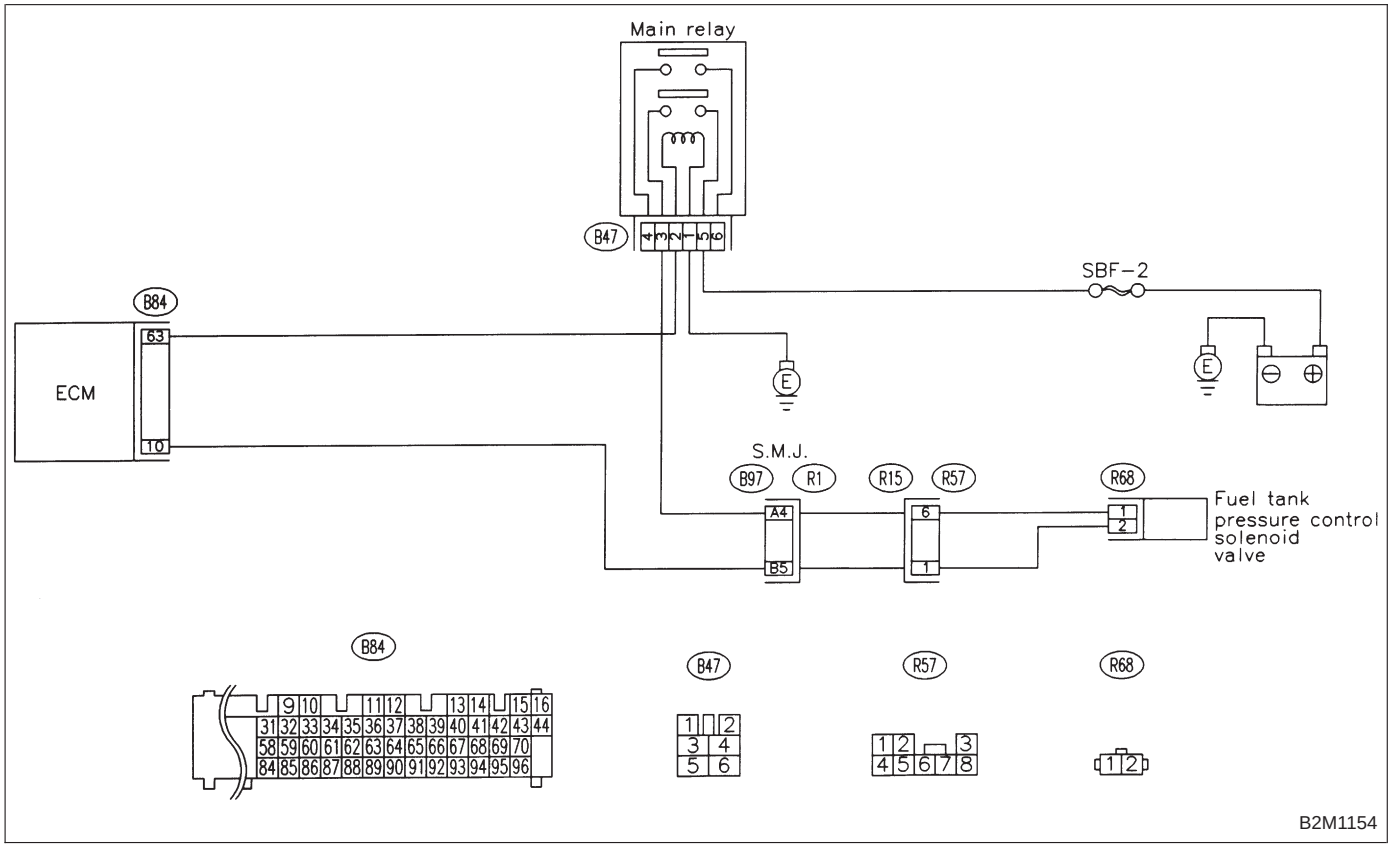
B2M1130

CI: DTC P1400 — FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW INPUT —

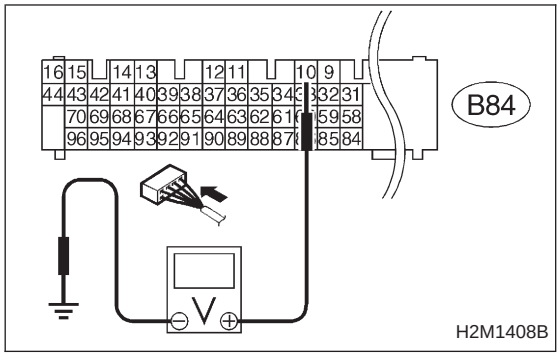
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



11CI1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 10 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Go to next CHECK .

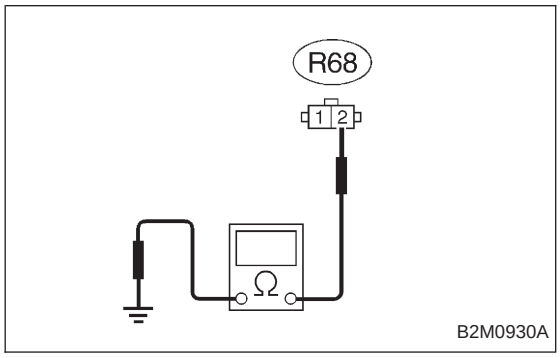
NO : Go to step **11CI2**.

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.



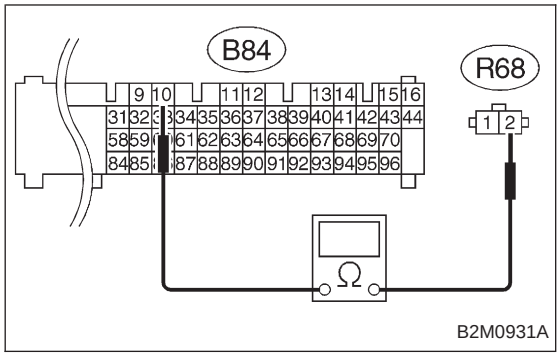
11CI2	CHECK HARNESS BETWEEN FUEL TANK PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connectors from fuel tank pressure control solenoid valve and ECM.
3) Measure resistance of harness between fuel tank pressure control solenoid valve connector and chassis ground.

CHECK ***: Connector & terminal (R68) No. 2 — Chassis ground: Is the resistance less than 10 Ω?***

YES : Repair ground short circuit in harness between ECM and fuel tank pressure control solenoid valve connector.

NO : Go to next step 4).



4) Measure resistance of harness between ECM and fuel tank pressure control solenoid valve connector.

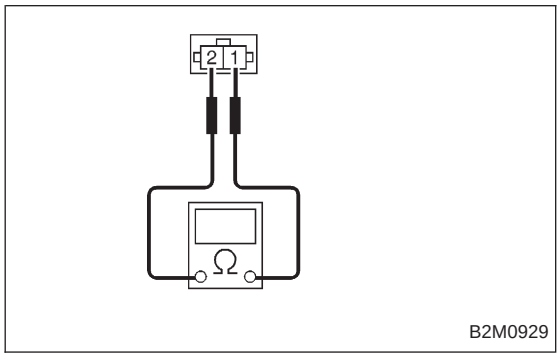
CHECK ***: Connector & terminal***
(B84) No. 10 — (R68) No. 2:
Is the voltage less than 1 Ω?

YES : Go to step **11CI3**.

NO : Repair harness and connector.

NOTE:
In this case, repair the following:

- Open circuit in harness between ECM and fuel tank pressure control solenoid valve connector
- Poor contact in coupling connectors (B97 and R57)



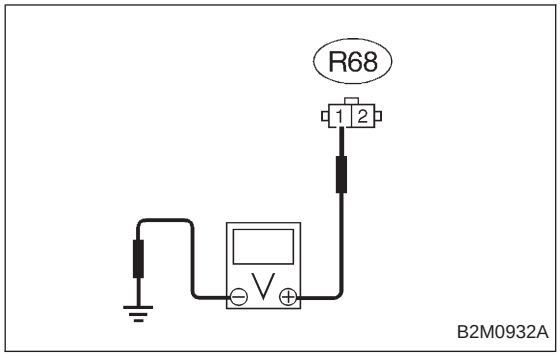
11CI3	CHECK FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

Measure resistance between fuel tank pressure control solenoid valve terminals.

CHECK ***: Terminals***
No. 1 — No. 2:
Is the resistance between 10 and 100 Ω?

YES : Go to step **11CI4**.

NO : Replace fuel tank pressure control solenoid valve.



11CI4	**CHECK POWER SUPPLY TO FUEL TANK PRESSURE CONTROL SOLENOID VALVE.**

1) Turn ignition switch to ON.
2) Measure voltage between fuel tank pressure control solenoid valve and chassis ground.

CHECK ***: Connector & terminal (R68) No. 1 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between main relay and fuel tank pressure control solenoid valve connector
- Poor contact in coupling connectors (B97 and R57)
- Poor contact in main relay connector

CHECK ***: Is there poor contact in fuel tank pressure control solenoid valve connector?***

YES : Repair poor contact in fuel tank pressure control solenoid valve connector.

NO : Contact with SOA service.

NOTE:
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

OBD (FB1)

P1420<PCVSOL_HI>

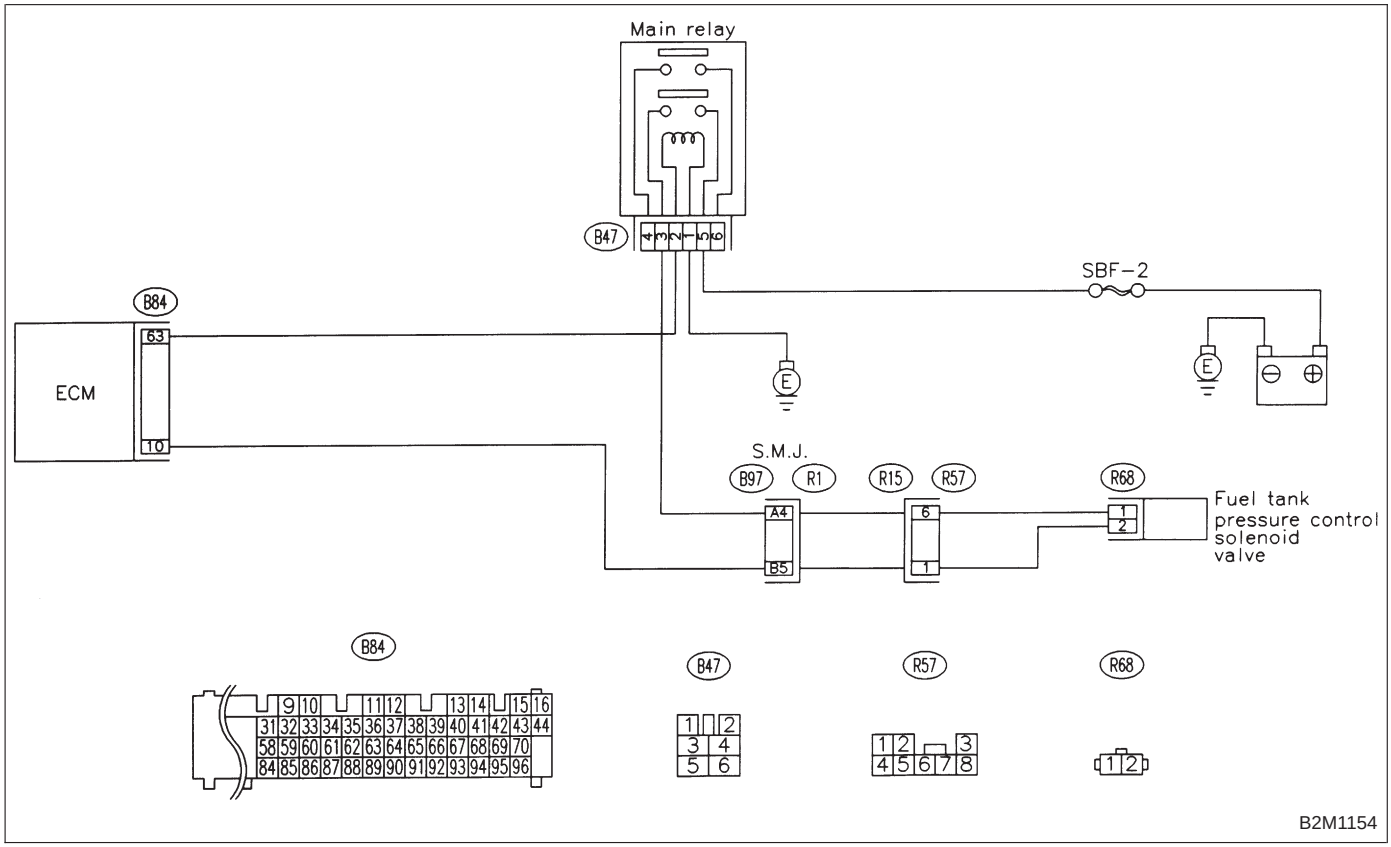
B2M1131

CJ: DTC P1420 — FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT HIGH INPUT —

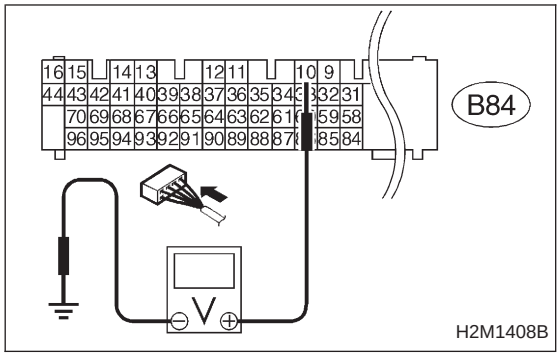
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



11CJ1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 10 (+) — Chassis ground (−): Is the voltage more than 10 V?***

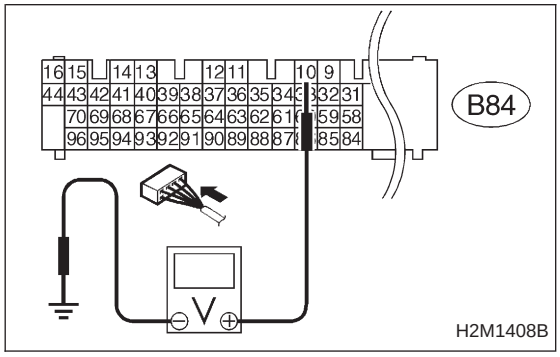
YES : Go to step **11CJ2**.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



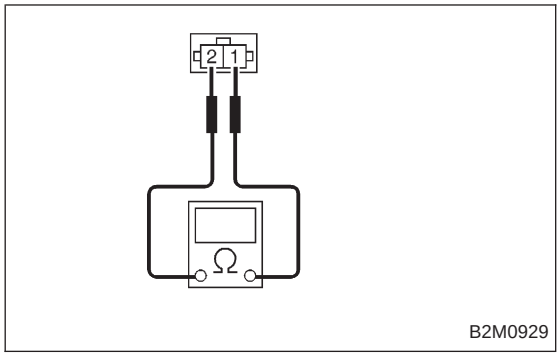
11CJ2	CHECK HARNESS BETWEEN FUEL TANK PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from fuel tank pressure control solenoid valve.
3) Turn ignition switch to ON.
4) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 10 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and fuel tank pressure control solenoid valve connector. After repair, replace ECM.

NO : Go to next step 5).



5) Turn ignition switch to OFF.
6) Measure resistance between fuel tank pressure control solenoid valve terminals.

CHECK ***: Terminals No. 1 — No. 2: Is the resistance less than 1 Ω?***

YES : Replace fuel tank pressure control solenoid valve and ECM.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.

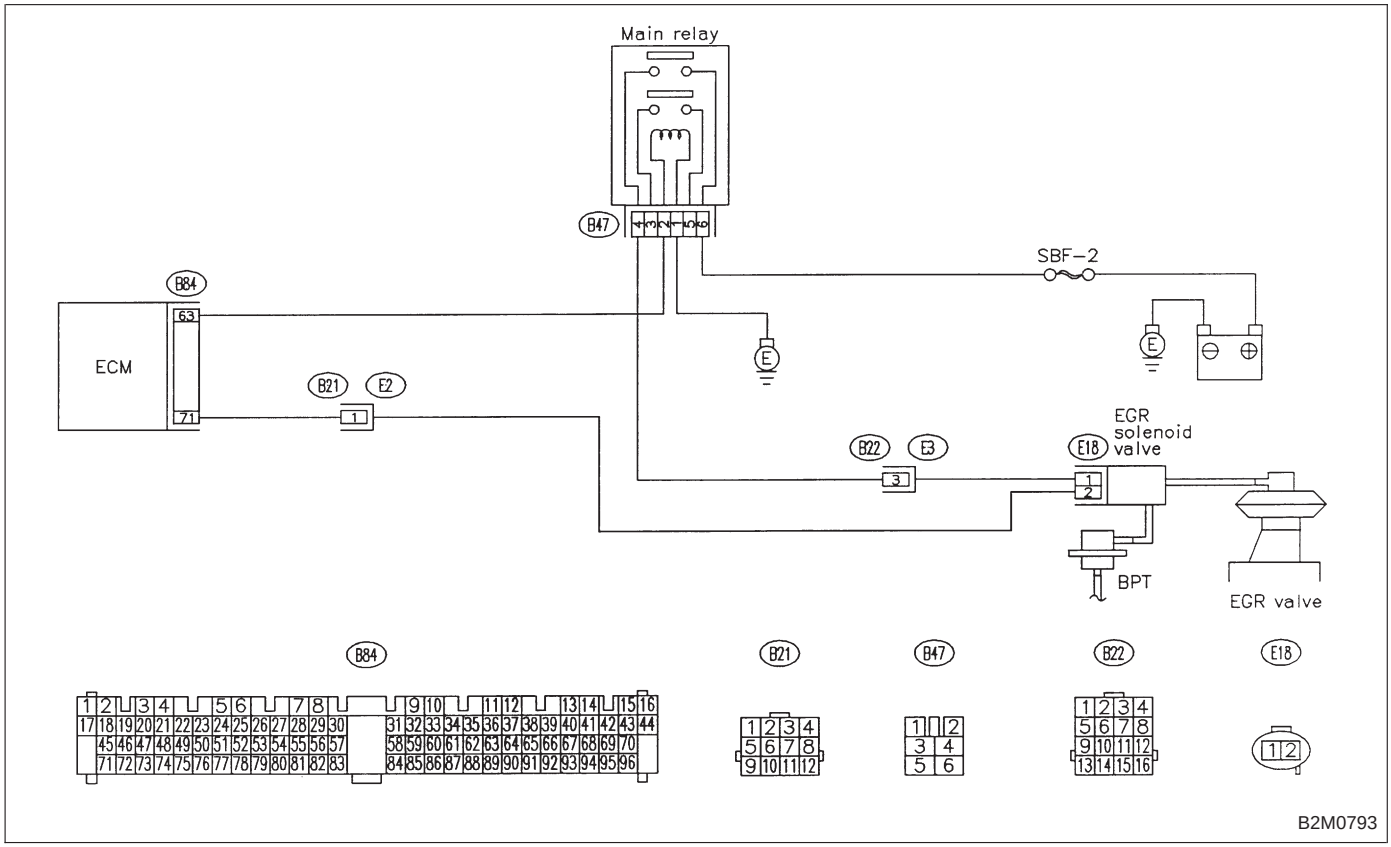
OBD (FB1)

P1421<EGRSOL_HI>

B2M1132

CK: DTC P1421
— EXHAUST GAS RECIRCULATION CIRCUIT HIGH INPUT —

WIRING DIAGRAM:



B2M0793

NOTE:
Check exhaust gas recirculation control solenoid valve circuit.
<Ref. to 2-7 [T10CN0].>

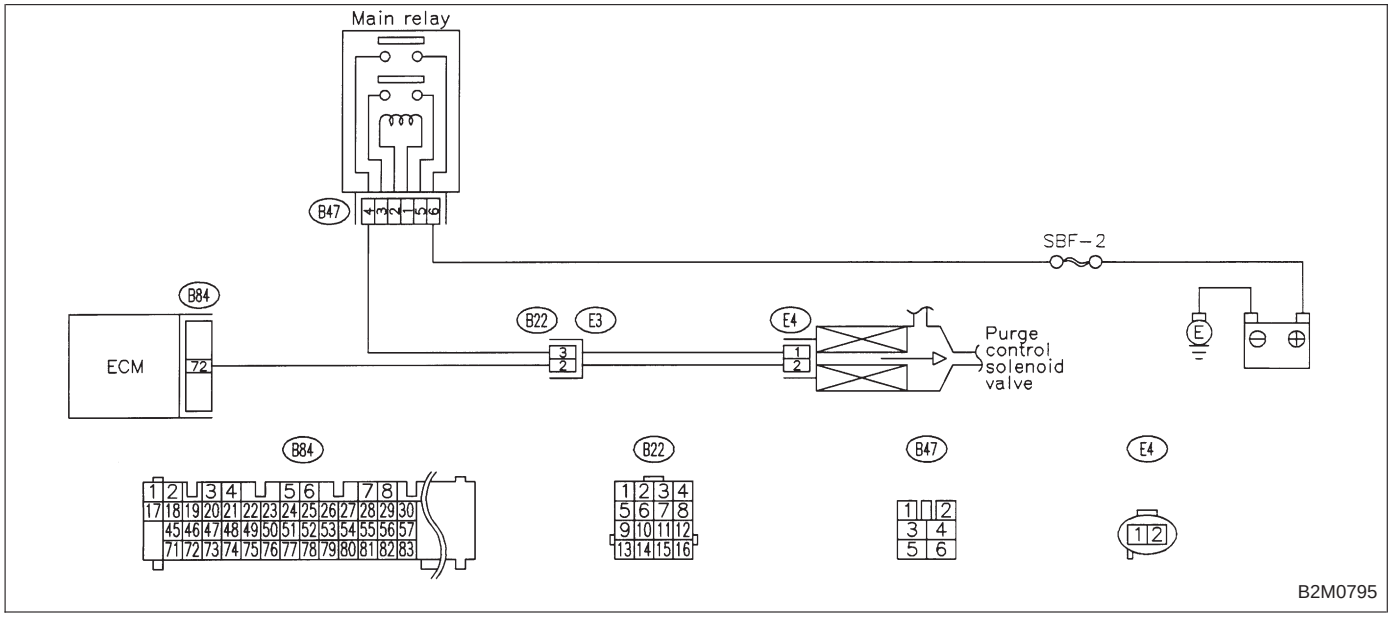
OBD (FB1)

P1422 <CPC_HI>

B2M1133

CL: DTC P1422 — EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH INPUT —

WIRING DIAGRAM:



NOTE:
Check canister purge control system.
<Ref. to 2-7 [T10CO0].>

OBD (FB1)

P1423<VCMSOL_HI>

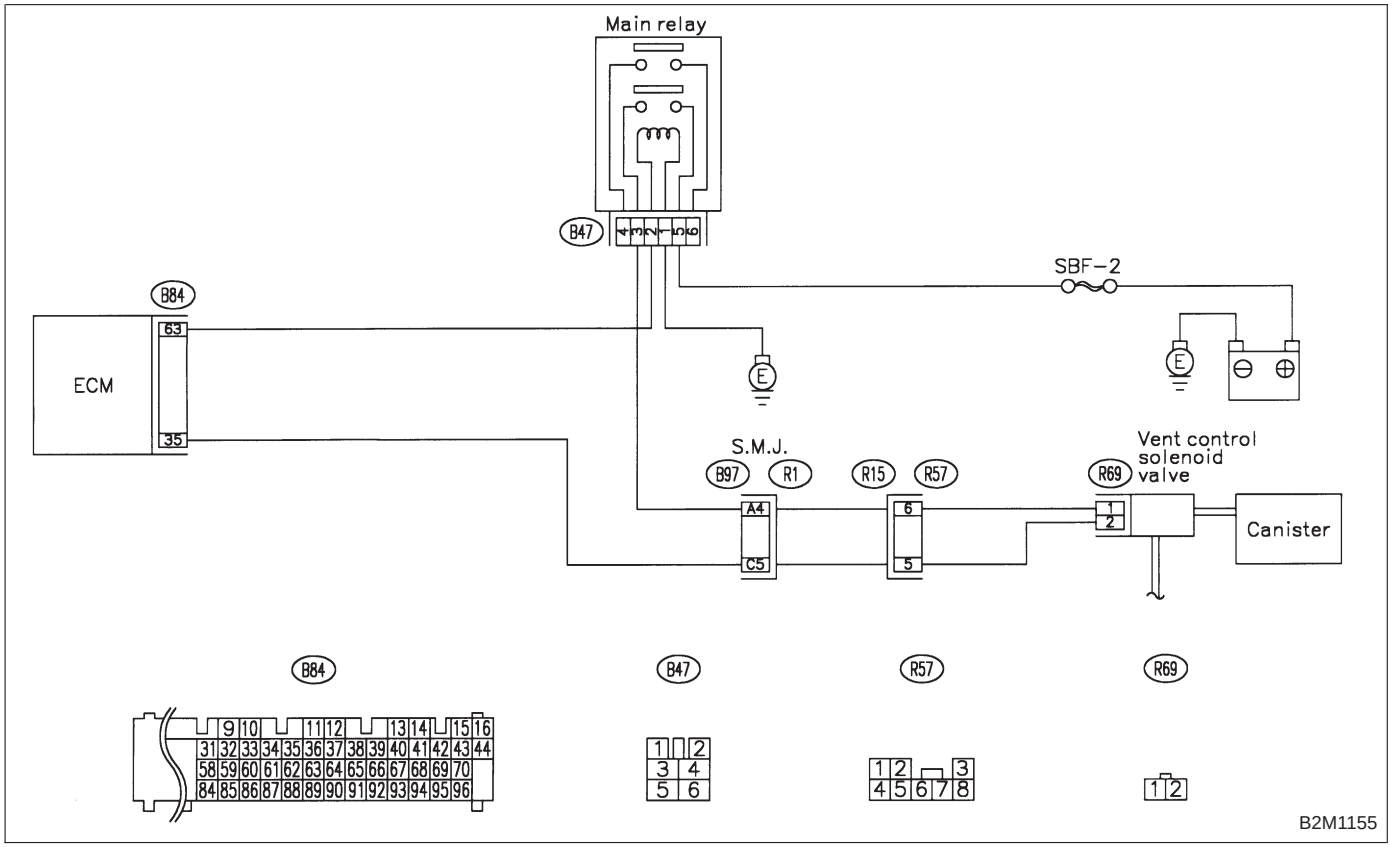
B2M1134

CM: DTC P1423 — EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL HIGH INPUT —

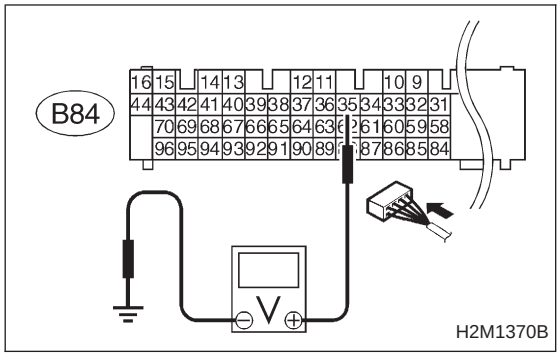
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>



11CM1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 35 (+) — Chassis ground (−): Is the voltage more than 10 V?***

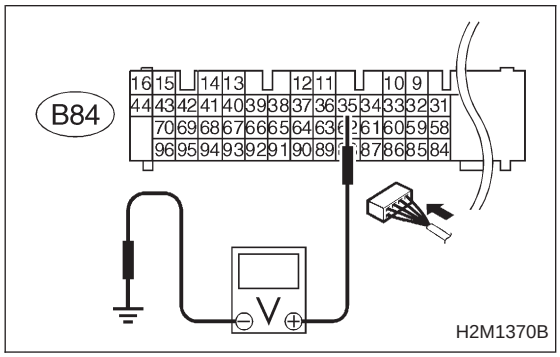
YES : Go to step **11CM2**.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



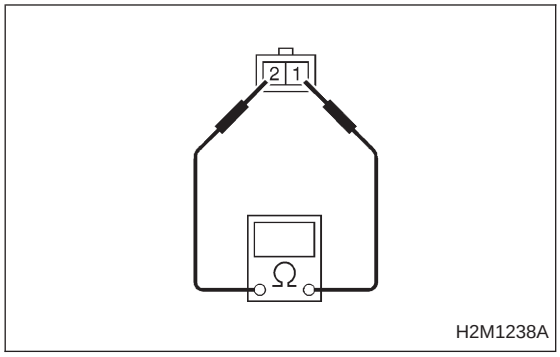
11CM2	CHECK HARNESS BETWEEN VENT CONTROL SOLENOID VALVE AND ECM CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from vent control solenoid valve.
3) Turn ignition switch to ON.
4) Measure voltage between ECM and chassis ground.

CHECK ***: Connector & terminal (B84) No. 35 (+) — Chassis ground (−): Is the voltage more than 10 V?***

YES : Repair battery short circuit in harness between ECM and vent control solenoid valve connector. After repair, replace ECM.

NO : Go to next step 5).



5) Turn ignition switch to OFF.
6) Measure resistance between vent control solenoid valve terminals.

CHECK ***: Terminals No. 1 — No. 2: Is the resistance less than 1 Ω?***

YES : Replace vent control solenoid valve and ECM.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in ECM connector?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.

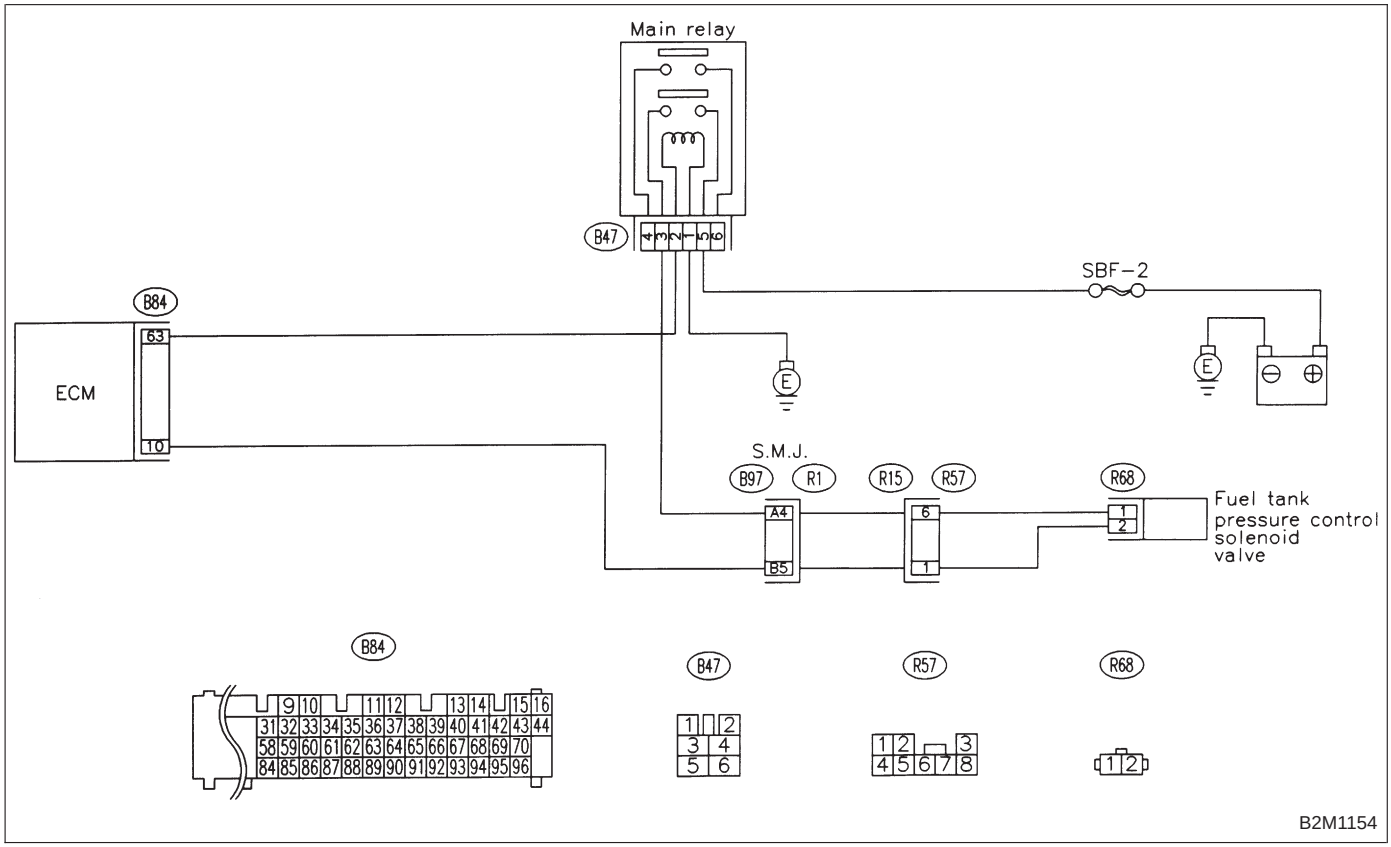
OBD (FB1)

P1440 <PCV_FLOW>

B2M1135

CN: DTC P1440 — FUEL TANK PRESSURE CONTROL SYSTEM FUNCTION PROBLEM (LOW INPUT) —

WIRING DIAGRAM:



B2M1154

NOTE:
Check fuel tank pressure control system.
<Ref. to 2-7 [T10CQ0].>

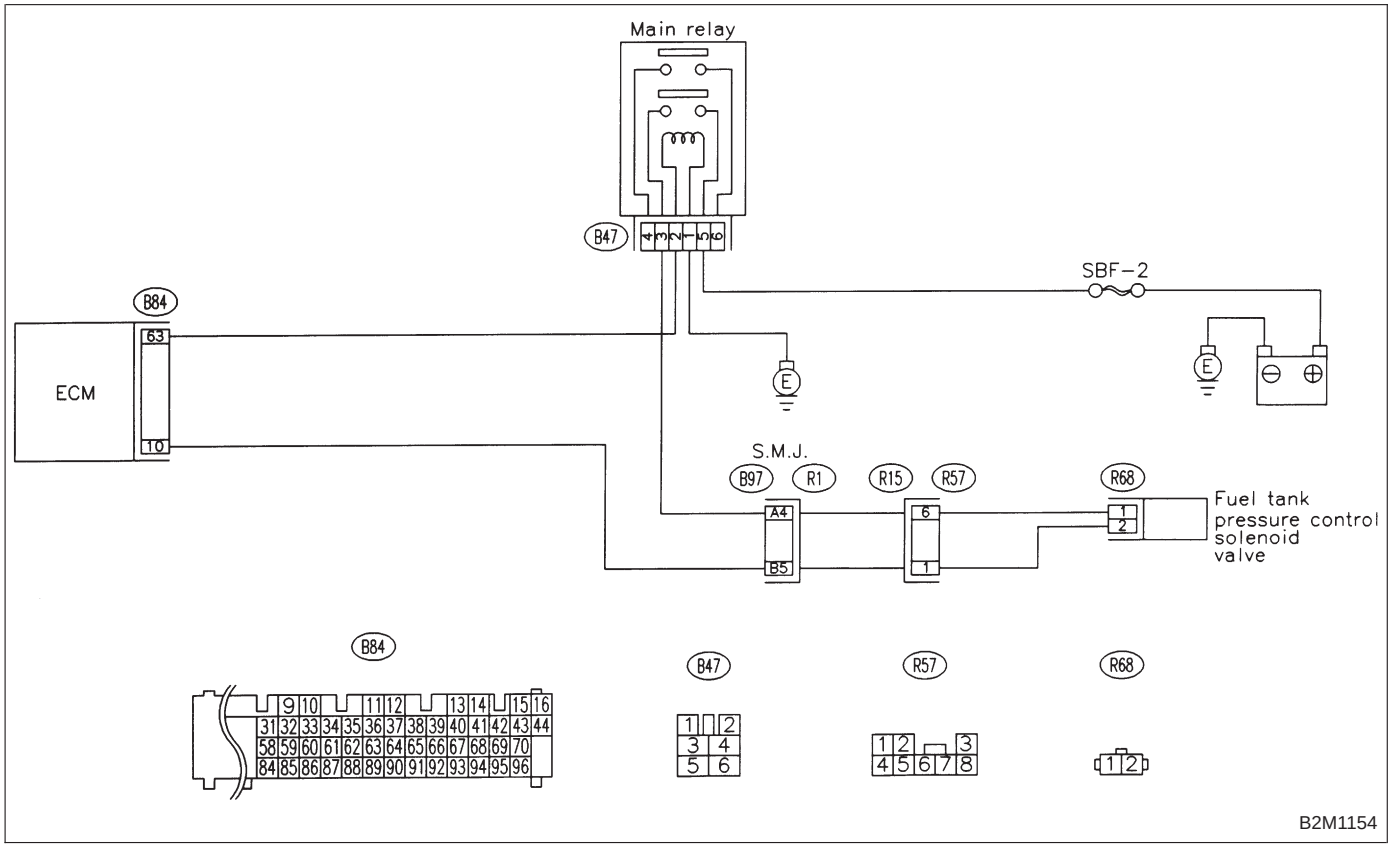
OBD (FB1)

P1441 <PCV_FHI>

B2M1136

CO: DTC P1441 — FUEL TANK PRESSURE CONTROL SYSTEM FUNCTION PROBLEM (HIGH INPUT) —

WIRING DIAGRAM:



NOTE:
Check fuel tank pressure control system.
<Ref. to 2-7 [T10CR0].>

OBD (FB1)

P1442 <FLVL_R2>

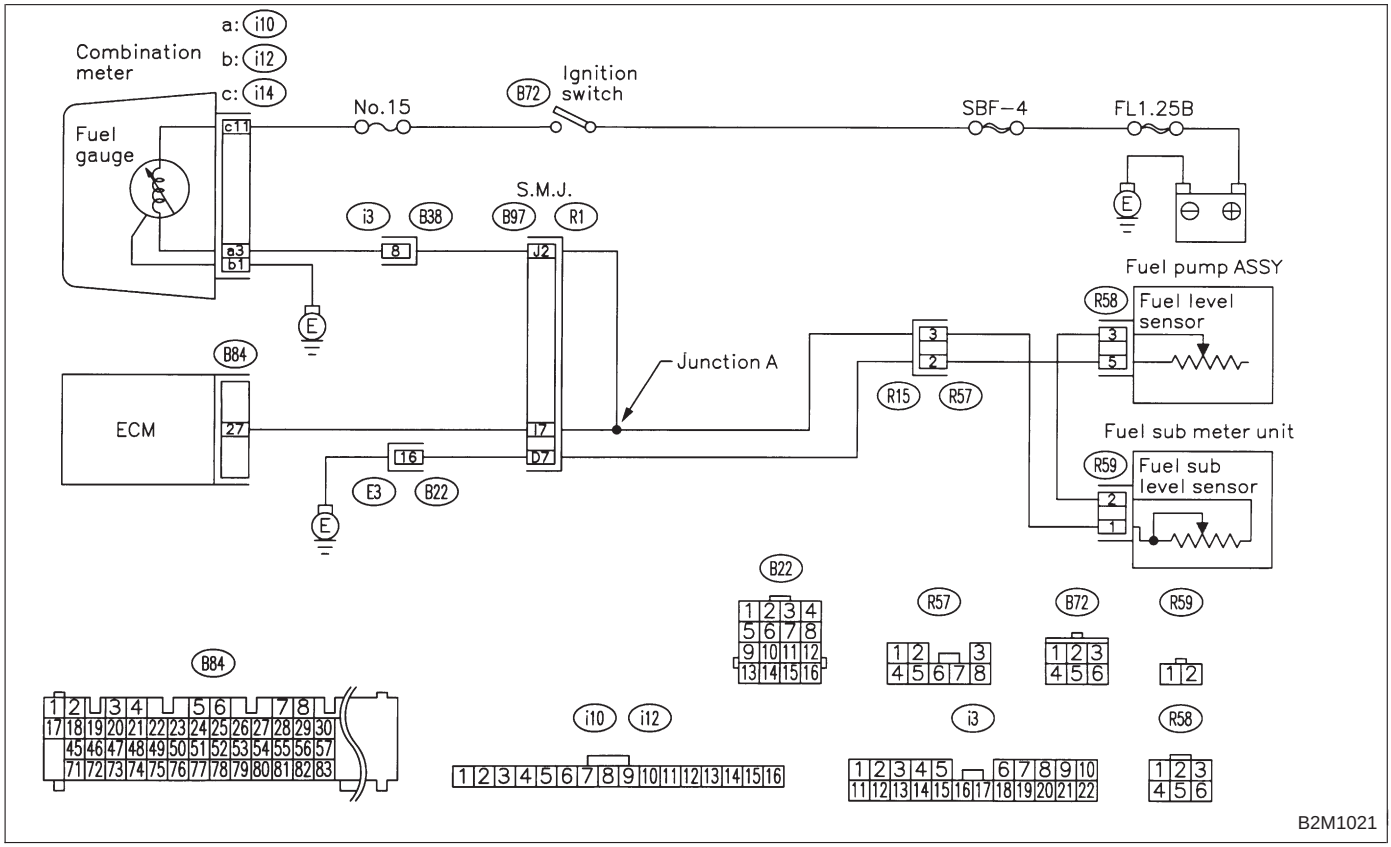
B2M1137

CP: DTC P1442 — FUEL LEVEL SENSOR CIRCUIT RANGE/ PERFORMANCE PROBLEM 2 —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

11CP1	**CHECK DTC P0461, P0462 OR P0463 ON DISPLAY.**

CHECK ***: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0461, P0462 or P0463?***

YES : Inspect DTC P0461, P0462 or P0463 using “11. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T11A0].>

NOTE:
In this case, it is not necessary to inspect this trouble.

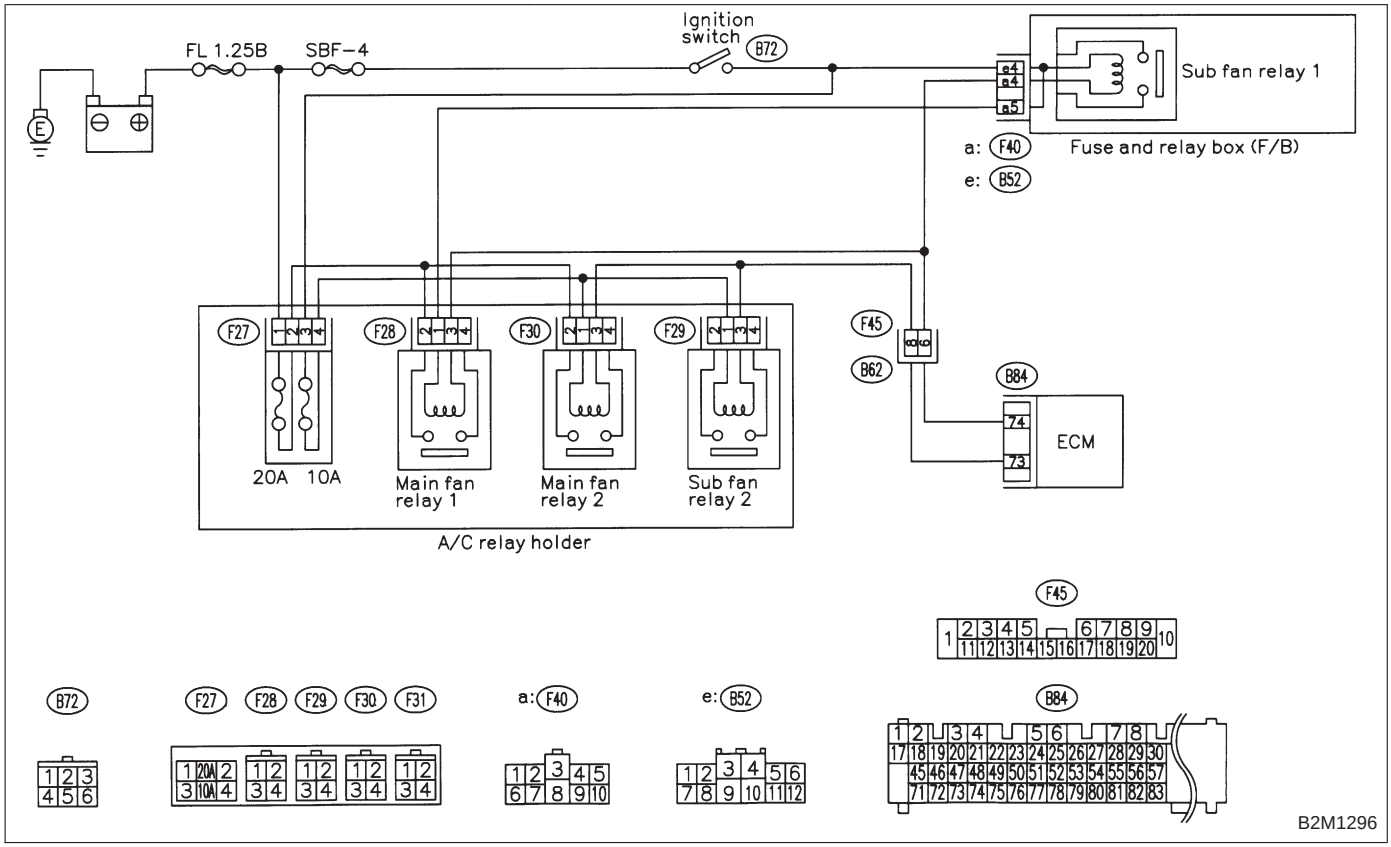
NO : Replace fuel sending unit and fuel sub meter unit.

OBD	(FB1)
P1500	<FAN_1>

OBD0527

CQ: DTC P1500 — RADIATOR FAN RELAY 1 CIRCUIT LOW INPUT —

WIRING DIAGRAM:



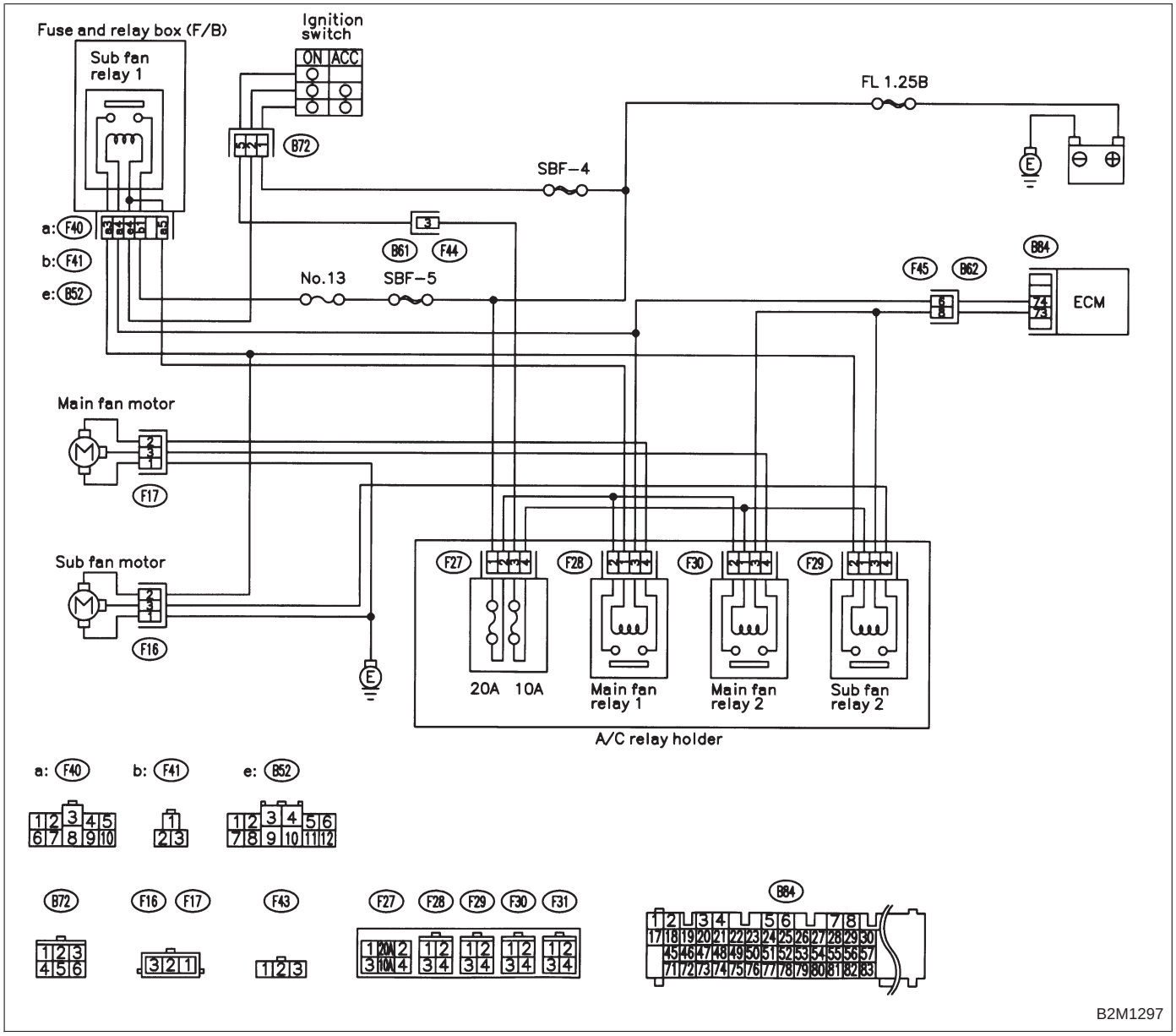
NOTE:
Check radiator fan relay 1 circuit.
<Ref. to 2-7 [T10CT0].>

OBD	(FB1)
P1502	<FAN_F>

OBD0538

CR: DTC P1502
— RADIATOR FAN FUNCTION PROBLEM —

WIRING DIAGRAM:



NOTE:
Check radiator fan control system.
<Ref. to 2-7 [T10CU0].>

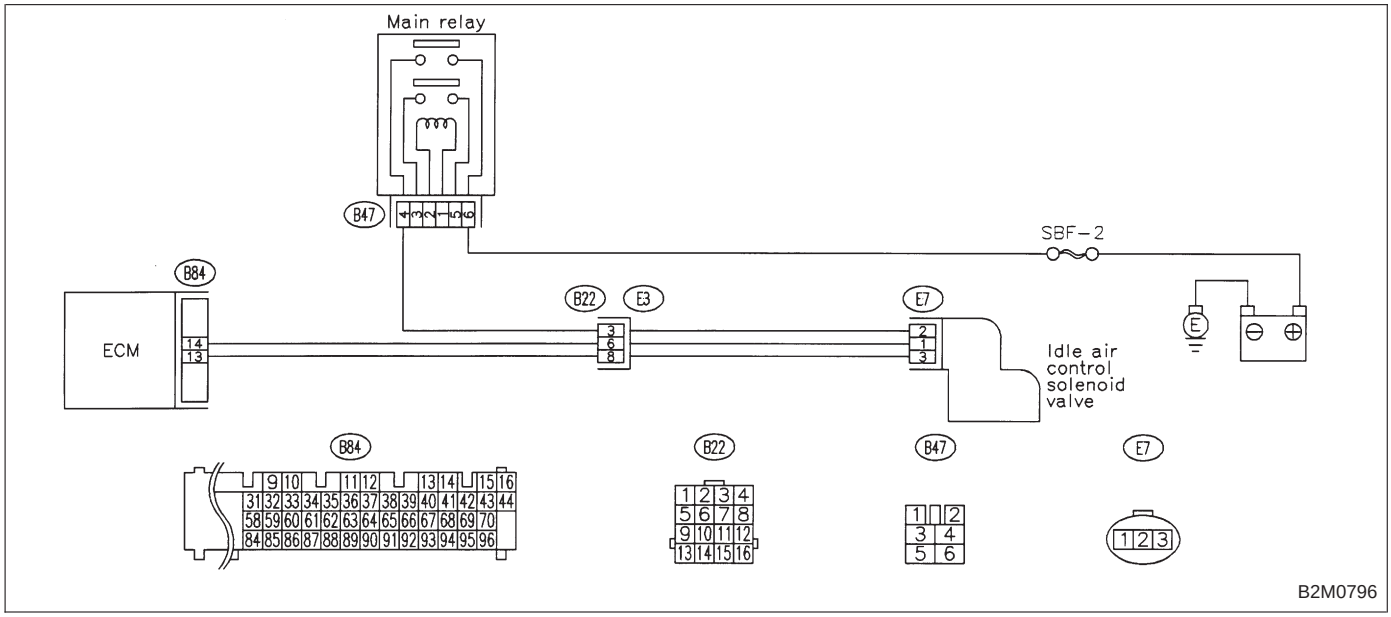
OBD (FB1)

P1507 <ISC_SHI>

B2M1140

CS: DTC P1507 — IDLE CONTROL SYSTEM MALFUNCTION (FAIL-SAFE) —

WIRING DIAGRAM:



B2M0796

NOTE:
Check idle air control system.
<Ref. to 2-7 [T10CV0].>

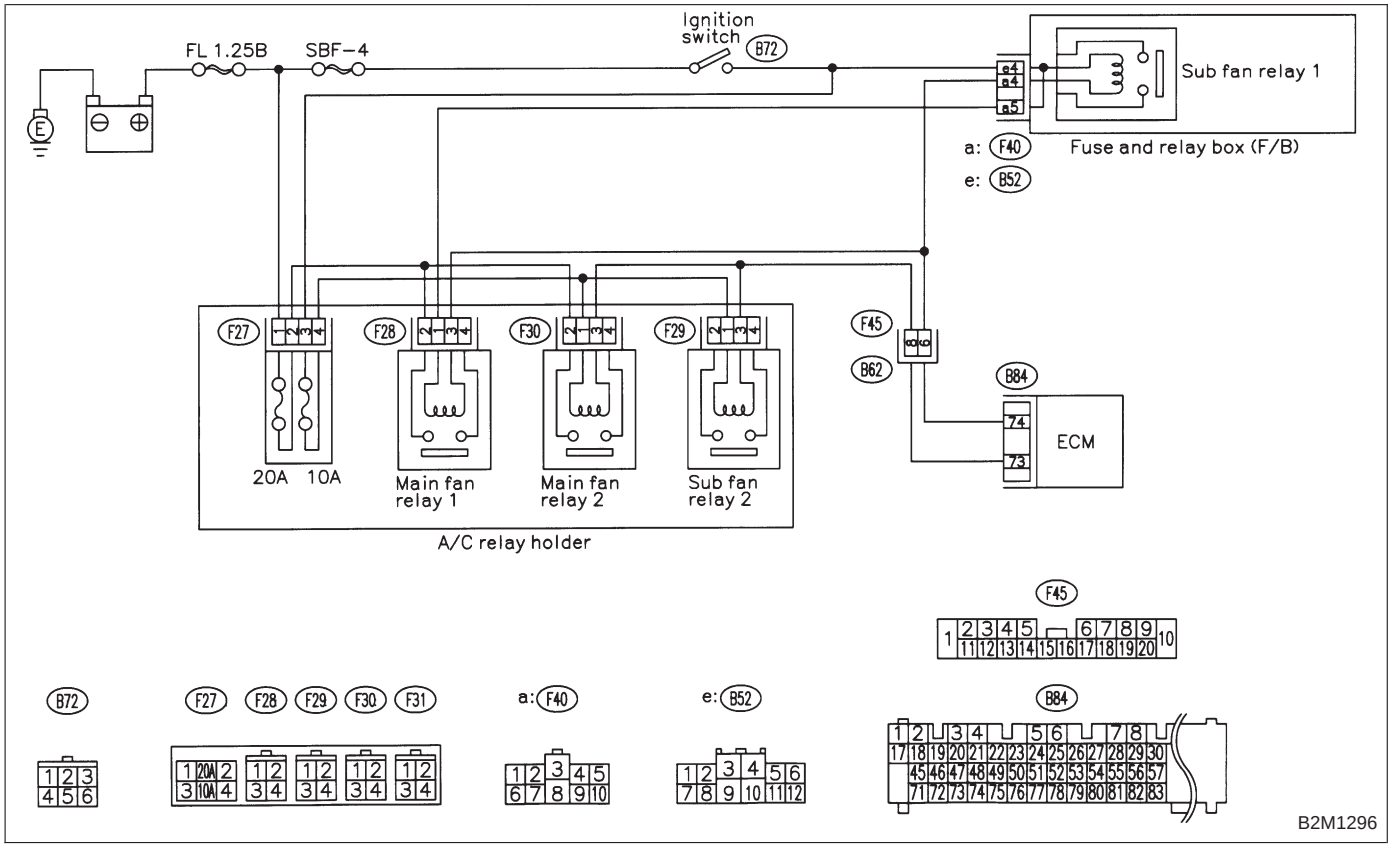
OBD (FB1)

P1520 <FAN_1HI>

B2M1141

CT: DTC P1520 — RADIATOR FAN RELAY 1 CIRCUIT HIGH INPUT —

WIRING DIAGRAM:



NOTE:
Check radiator fan relay 1 circuit.
<Ref. to 2-7 [T10CW0].>

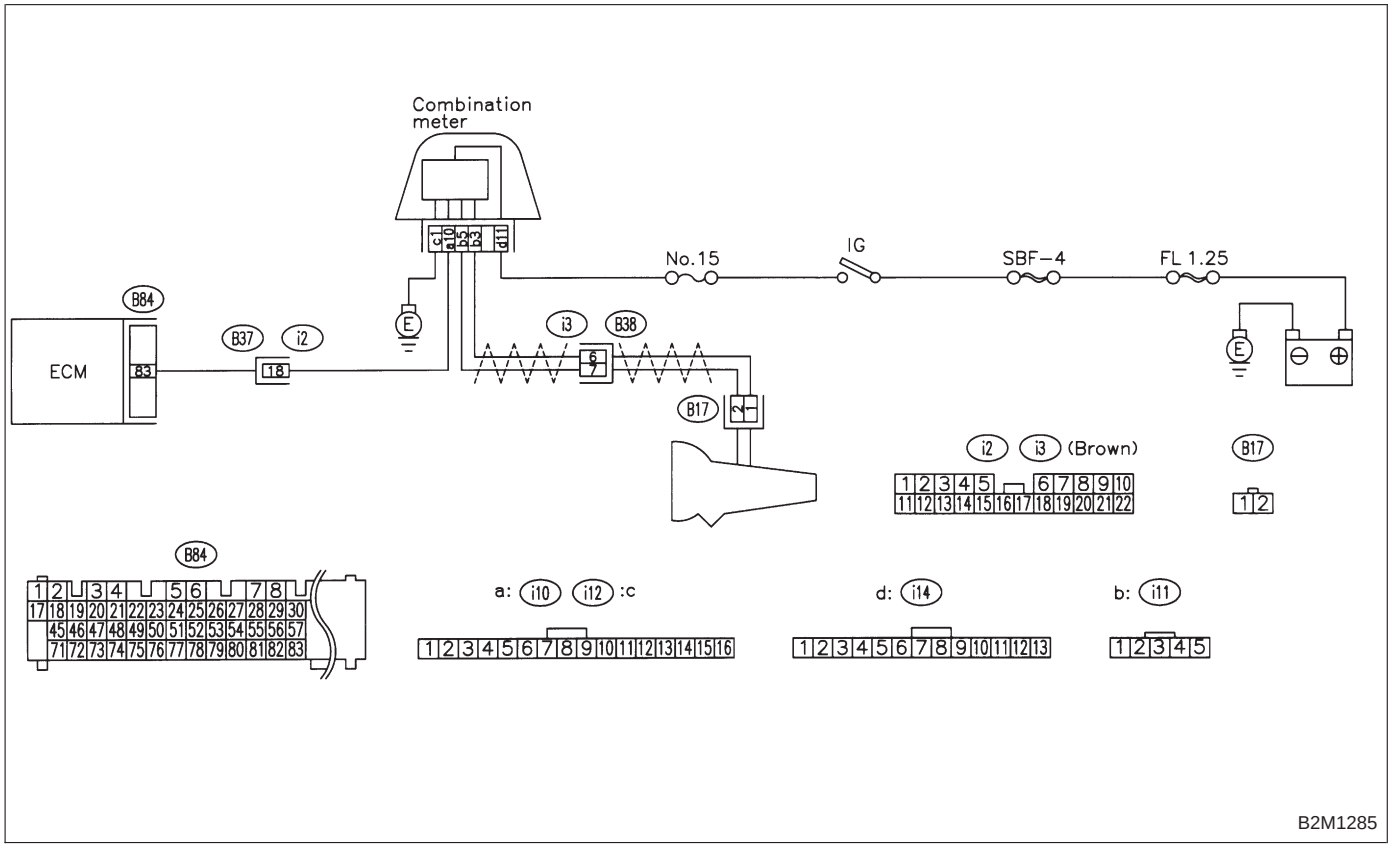
OBD (FB1)

P1540 <VSP_S>

B2M1142

CU: DTC P1540 — VEHICLE SPEED SENSOR MALFUNCTION 2 —

WIRING DIAGRAM:



B2M1285

NOTE:
Check vehicle speed sensor 2 circuit.
<Ref. to 2-7 [T10CX0].>

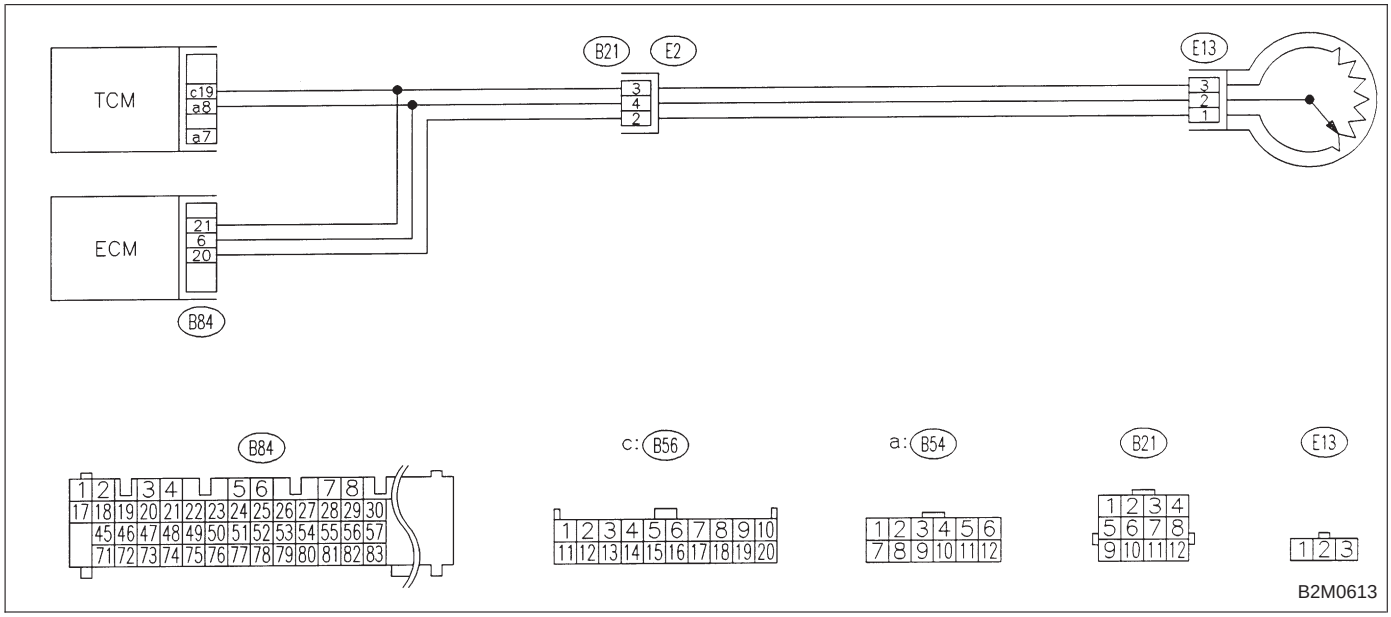
OBD (FB1)

P1700 <ATTH>

OBD0501

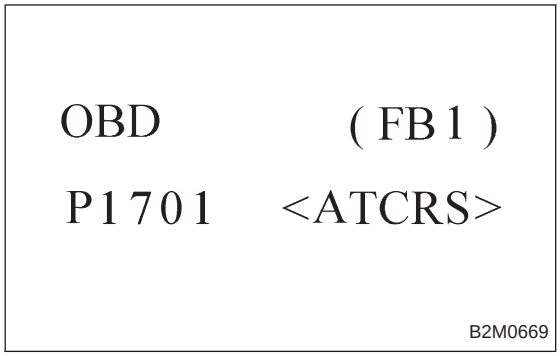
CV: DTC P1700 — THROTTLE POSITION SENSOR CIRCUIT MALFUNCTION —

WIRING DIAGRAM:



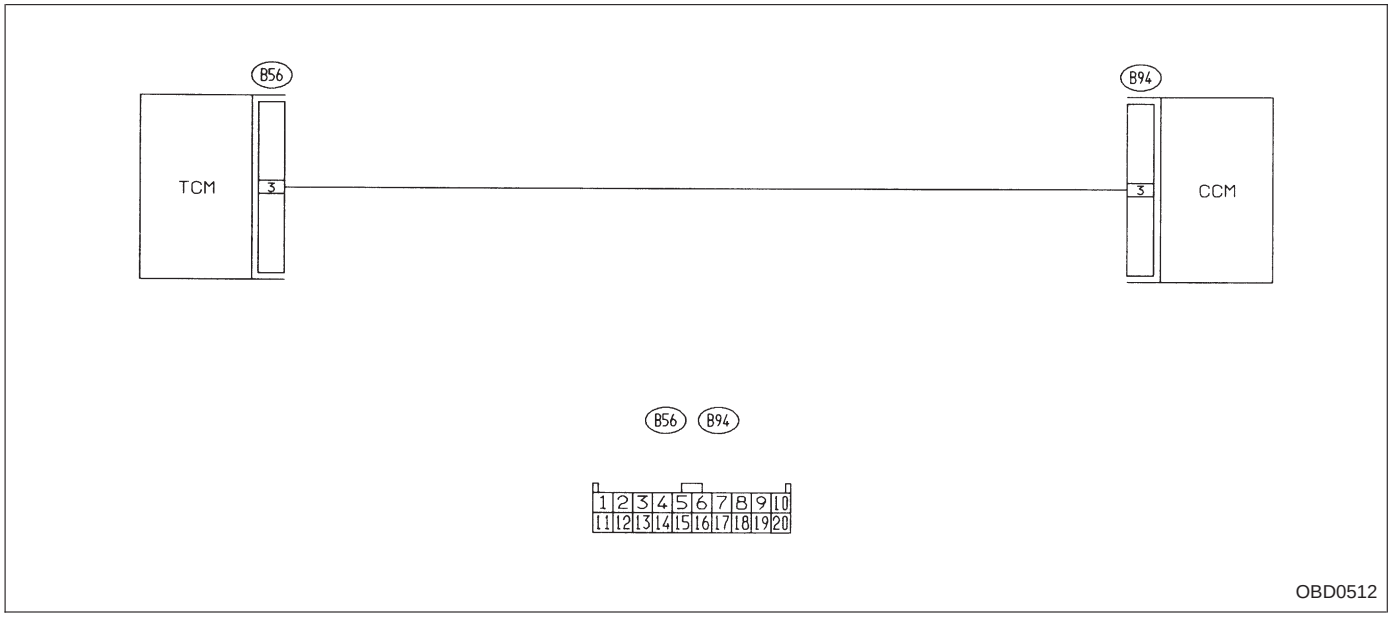
B2M0613

NOTE:
Check throttle position sensor circuit for automatic transmission.
<Ref. to 2-7 [T10CY0].>



CW: DTC P1701 — CRUISE CONTROL SET SIGNAL CIRCUIT MALFUNCTION —

WIRING DIAGRAM:



NOTE:
Check cruise control set signal circuit.
<Ref. to 2-7 [T10CZ0].>

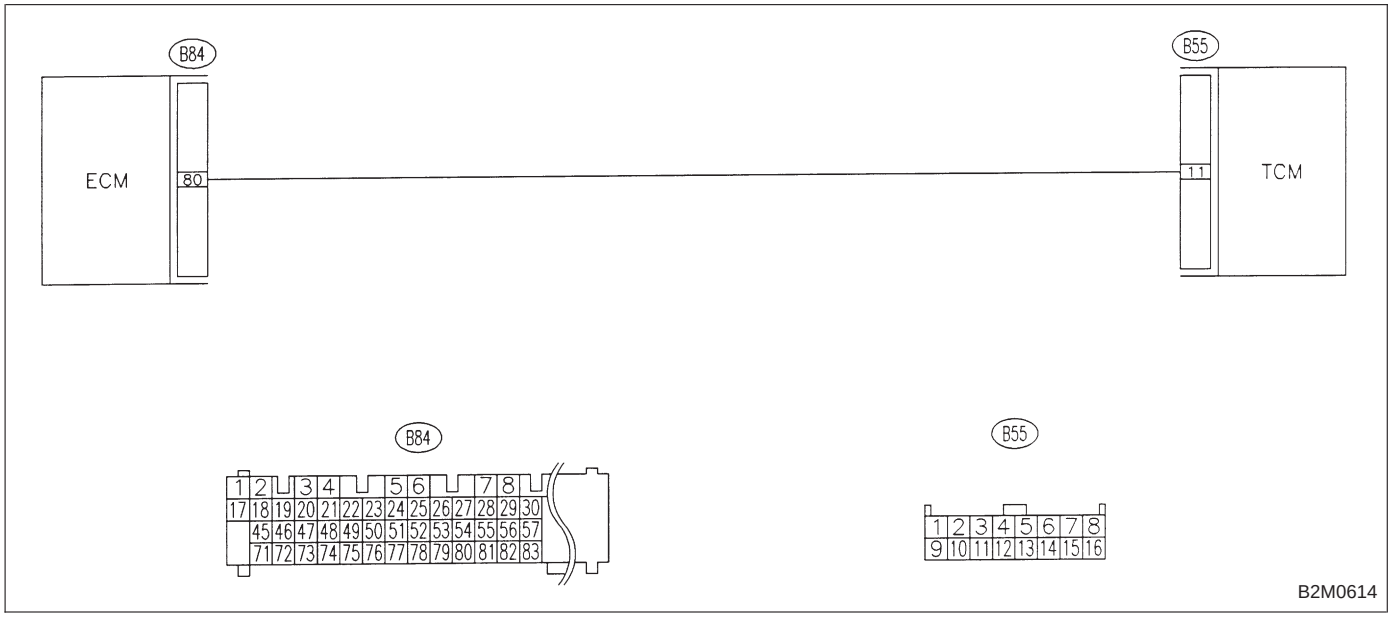
OBD (FB1)

P1702<ATDIAG_LO>

B2M1143

CX: DTC P1702
— AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT LOW INPUT —

WIRING DIAGRAM:



NOTE:
Check automatic transmission diagnosis input signal circuit.
<Ref. to 2-7 [T10DA0].>

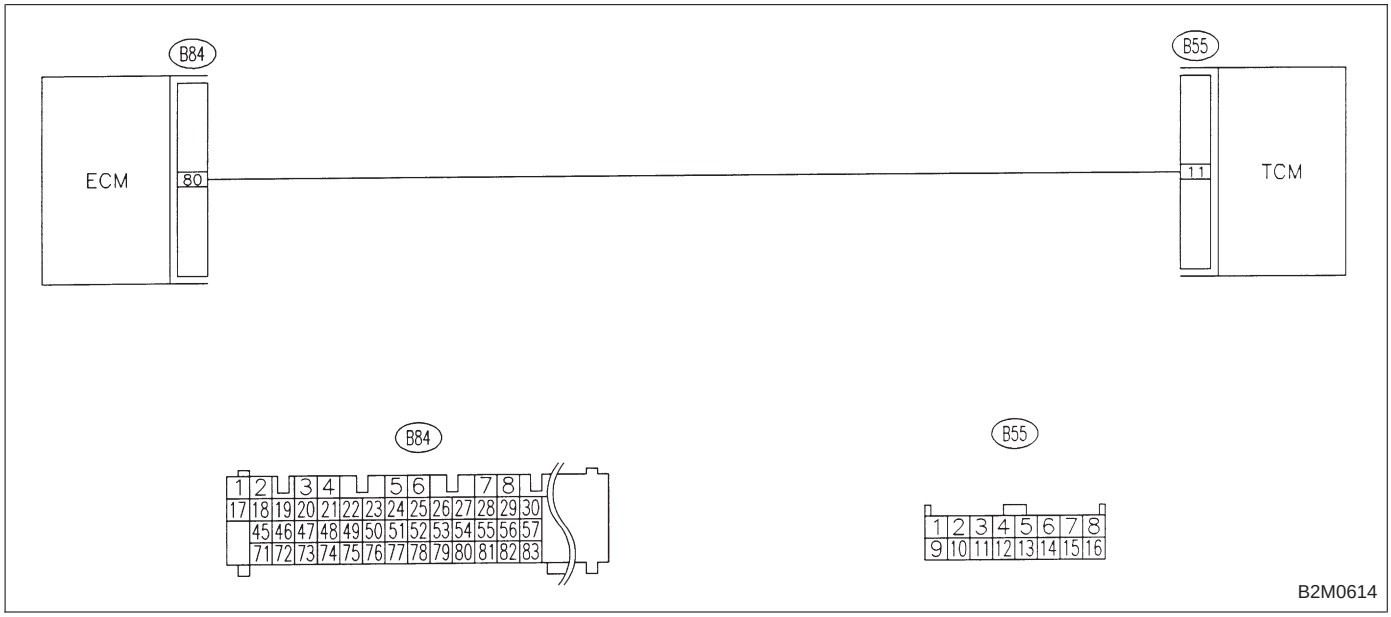
OBD (FB1)

P1722<ATDIAG_HI>

B2M1144

CY: DTC P1722
— AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT HIGH INPUT —

WIRING DIAGRAM:



B2M0614

NOTE:
Check automatic transmission diagnosis input signal circuit.
<Ref. to 2-7 [T10DB0].>

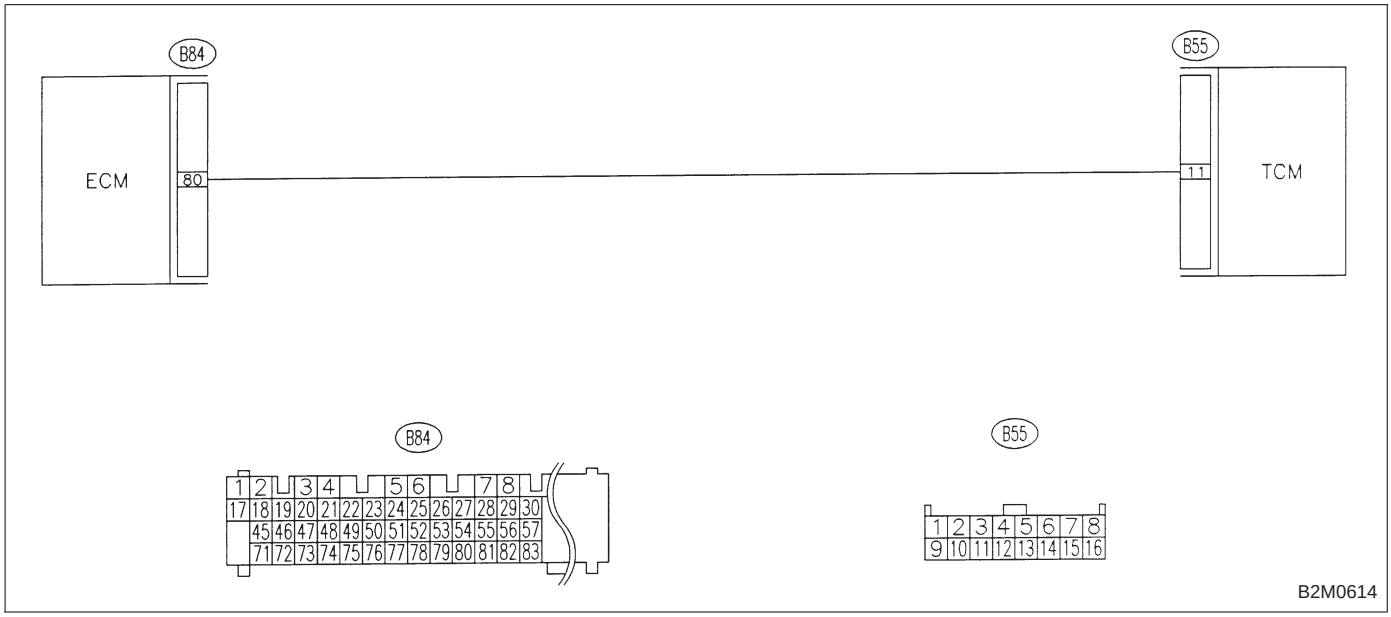
OBD (FB1)

P1742 <ATDIAG_2>

B2M1147

CZ: DTC P1742
— AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT MALFUNCTION —

WIRING DIAGRAM:



B2M0614

NOTE:
Check automatic transmission diagnosis input signal circuit.
<Ref. to 2-7 [T10DC0].>

1. Supplemental Restraint System “Airbag”

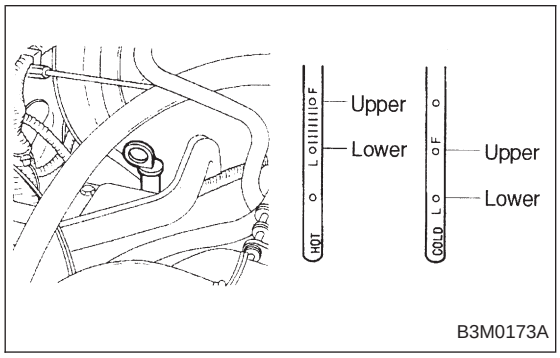
Airbag system wiring harness is routed near the transmission control module (TCM).

- **All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.**
- **Be careful not to damage Airbag system wiring harness when performing diagnostics and servicing the TCM.**

2. Pre-inspection

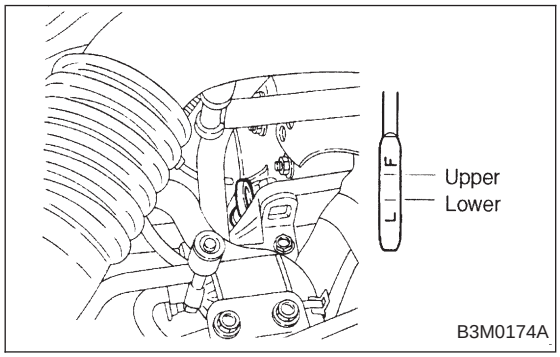
1. ATF LEVEL

Make sure that ATF level is in the specification.



2. FRONT DIFFERENTIAL OIL LEVEL

Make sure that front differential oil level is in the specification.



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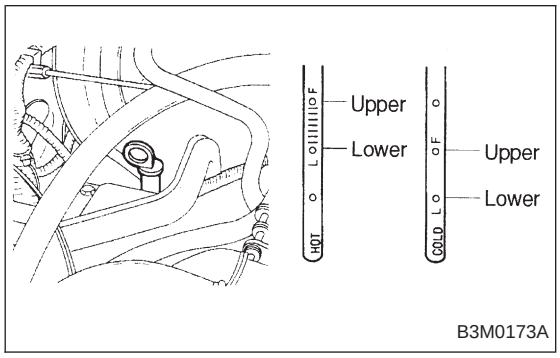
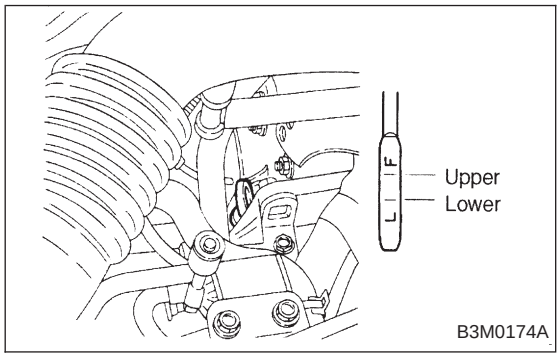
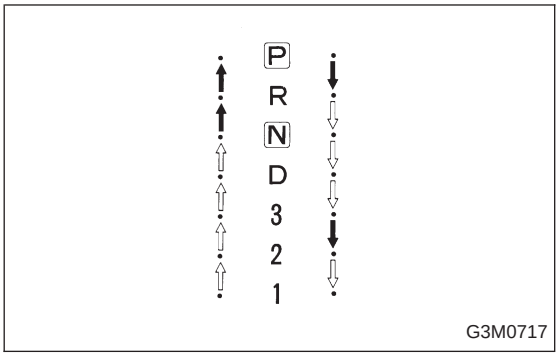


2. FRONT DIFFERENTIAL OIL LEVEL

Make sure that front differential oil level is in the specification.





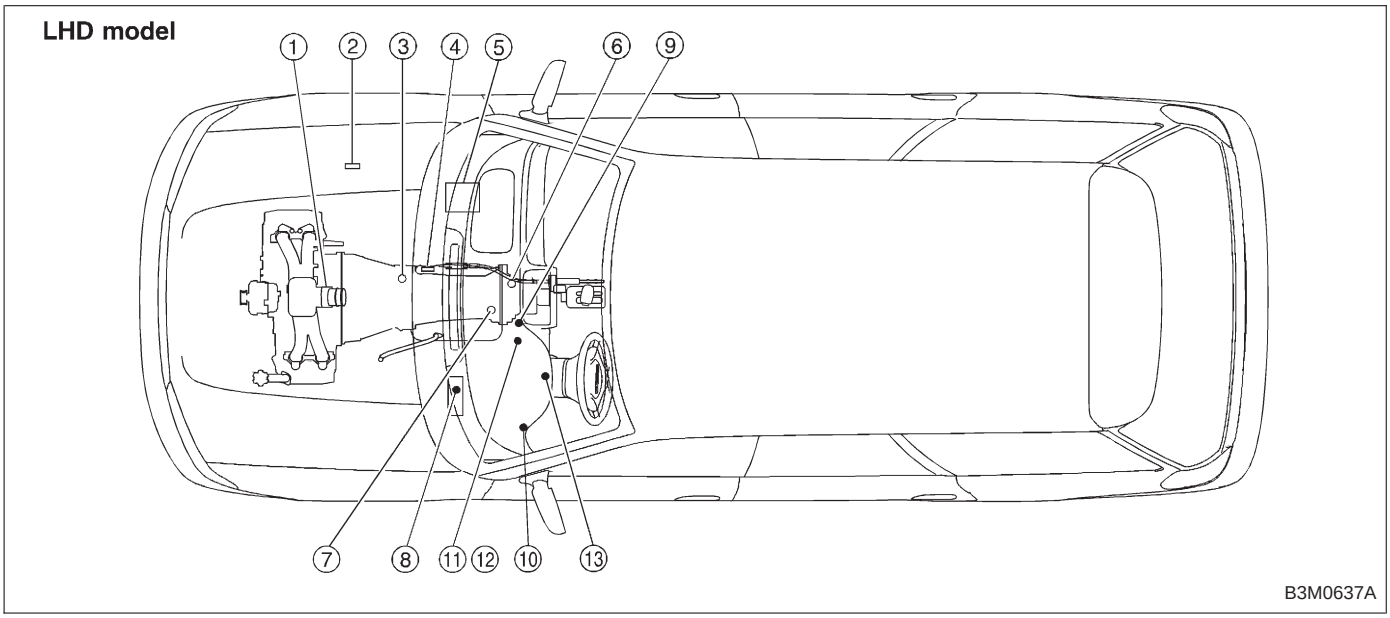
3. OPERATION OF SHIFT SELECTOR LEVER

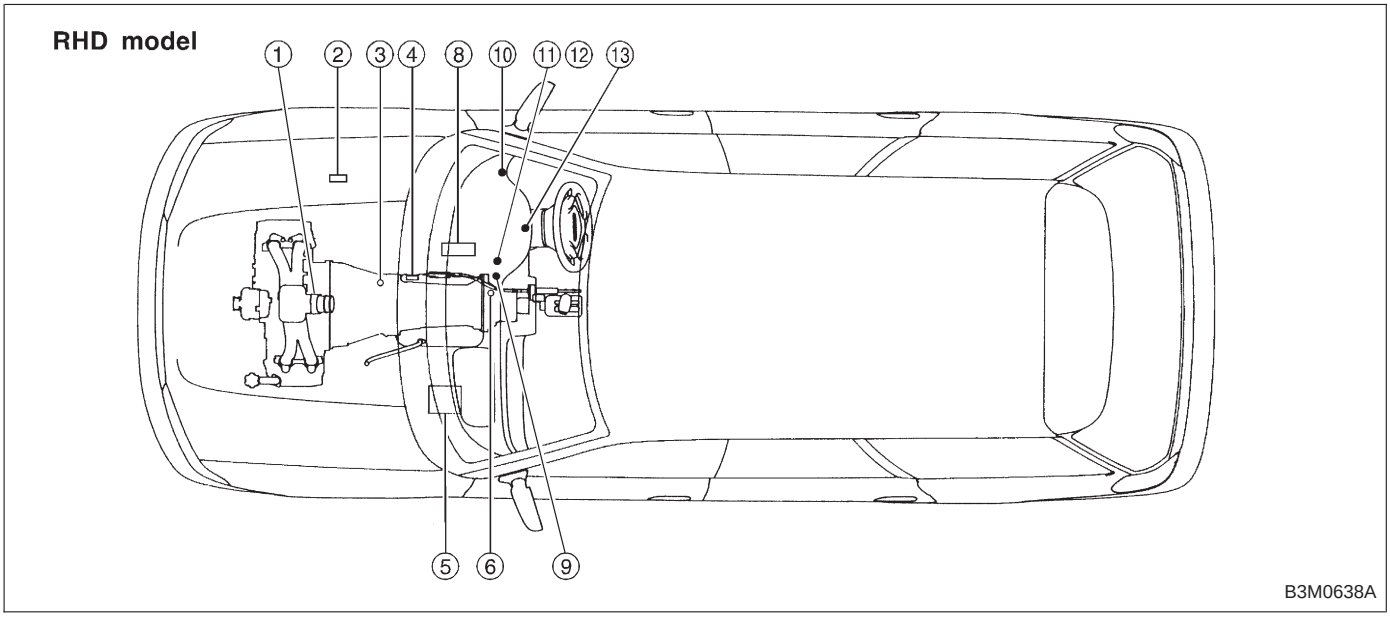
WARNING:
Stop the engine while checking operation of selector lever.

1) Check that selector lever does not move from “N” to “R” without pushing the button.
2) Check that selector lever does not move from “R” to “P” without pushing the button.
3) Check that selector lever does not move from “P” to “R” without pushing the button.
4) Check that selector lever does not move from “3” to “2” without pushing the button.

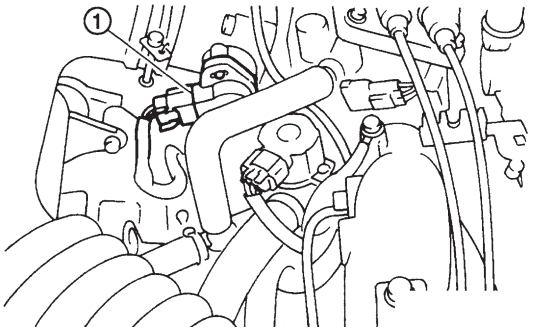
3. Electrical Components Location

1. SENSOR AND CONTROL MODULE

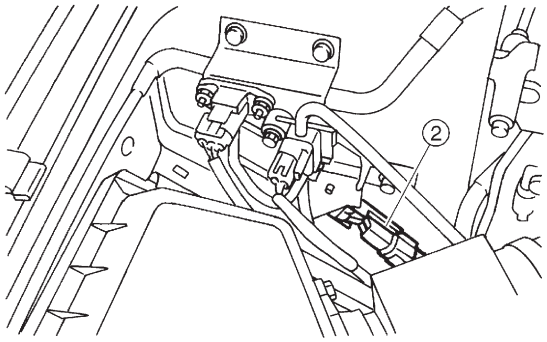




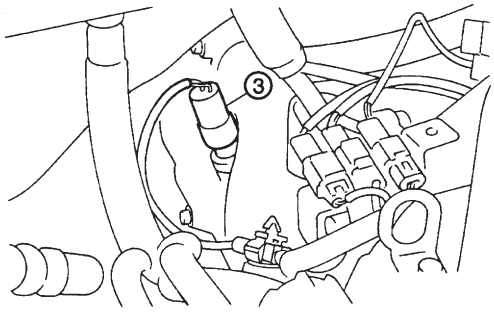
① Throttle position sensor
② Dropping resistor
③ Vehicle speed sensor 2
④ Inhibitor switch
⑤ ECM
⑥ Vehicle speed sensor 1 (AWD)
⑦ Vehicle speed sensor 1 (FWD)
⑧ TCM
⑨ Data link connector (for Subaru select monitor only)
⑩ Data link connector (for Subaru select monitor and OBD-II general scan tool)
⑪ Diagnosis connector
⑫ Diagnosis terminal
⑬ AT OIL TEMP indicator light (AT diagnostic indicator light)



B2M0155A

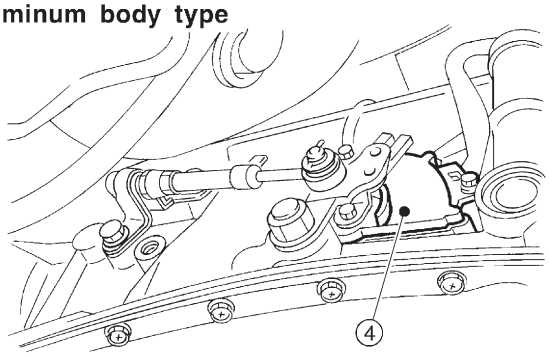


OBD0046A

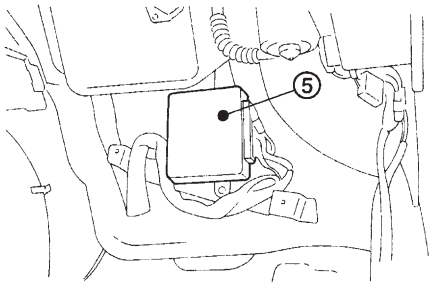


B2M0211A

Aluminum body type

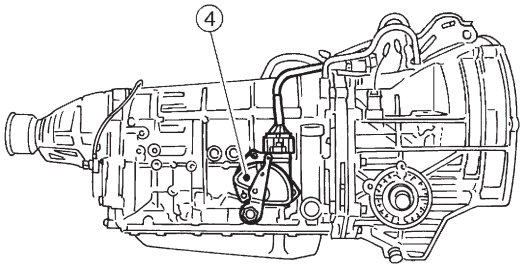


B3M0182C

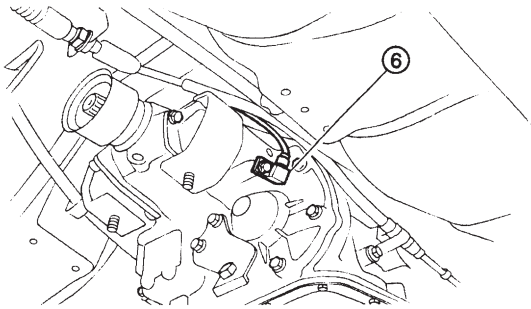


B3M0183A

Plastic body type



B2M1043C



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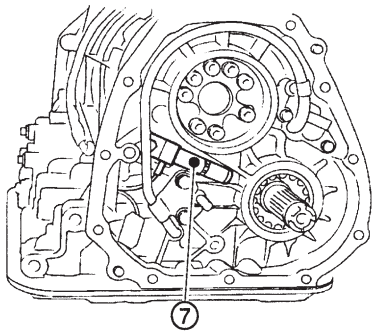
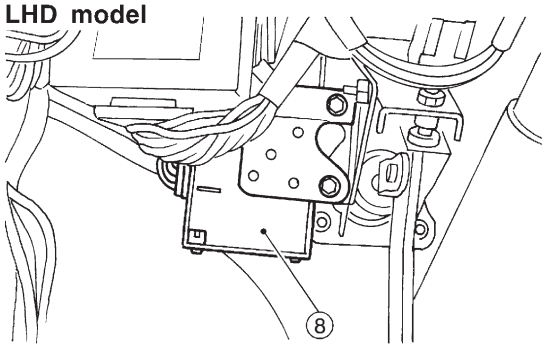


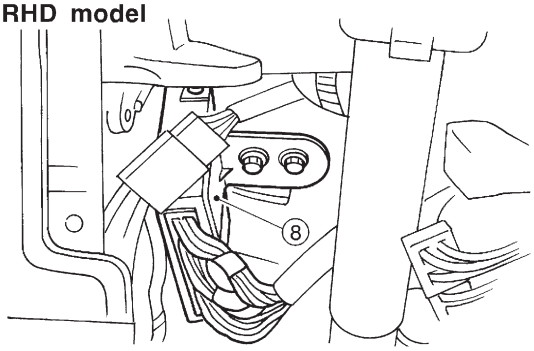
B3M0185A

LHD model

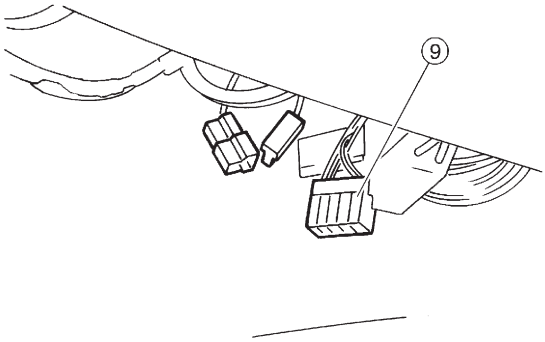


B3M0443G

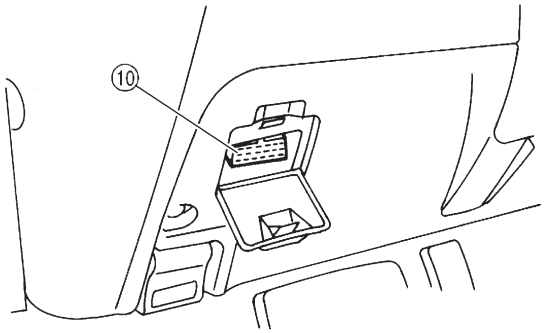
RHD model



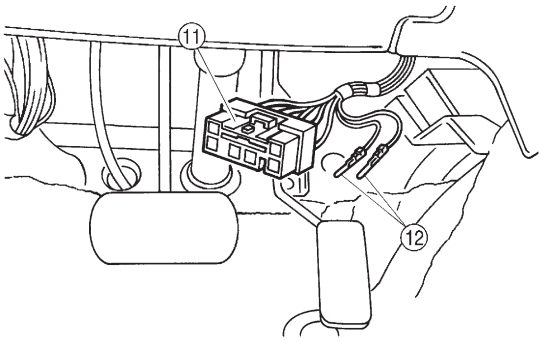
B3M0445C



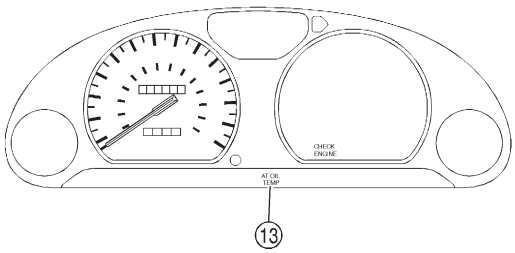
OBD0005C



OBD0006A

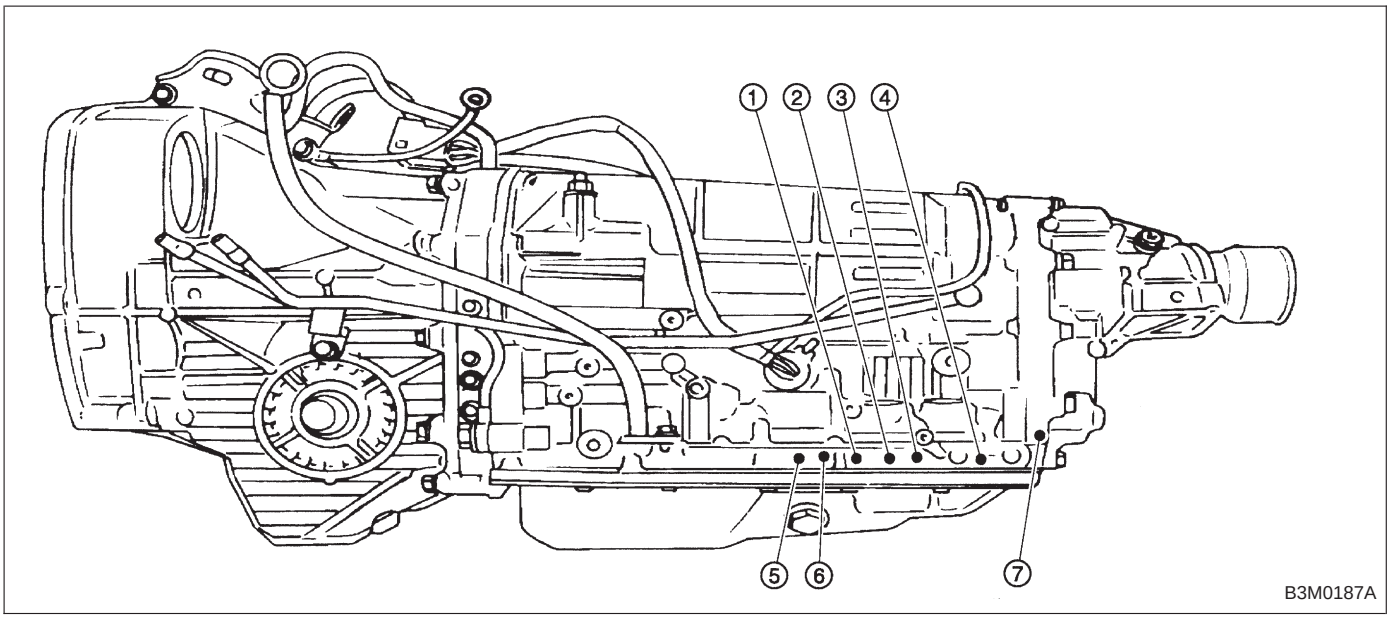


H3M1161A

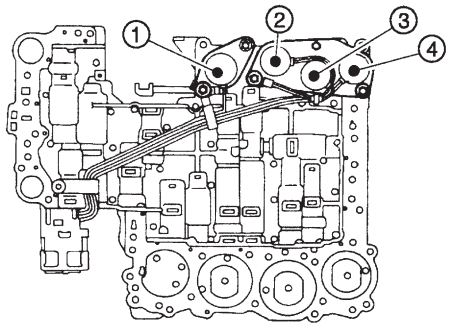


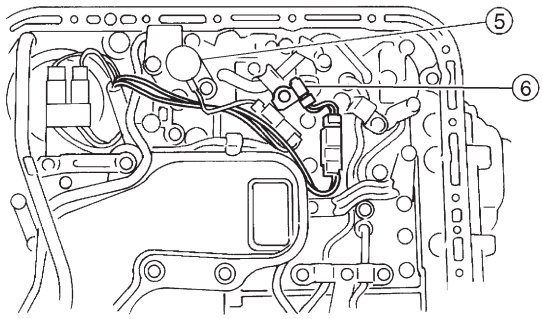
OBD0008D

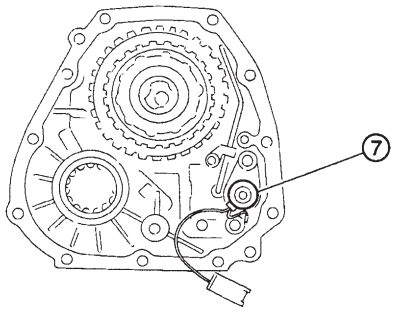
2. SOLENOID



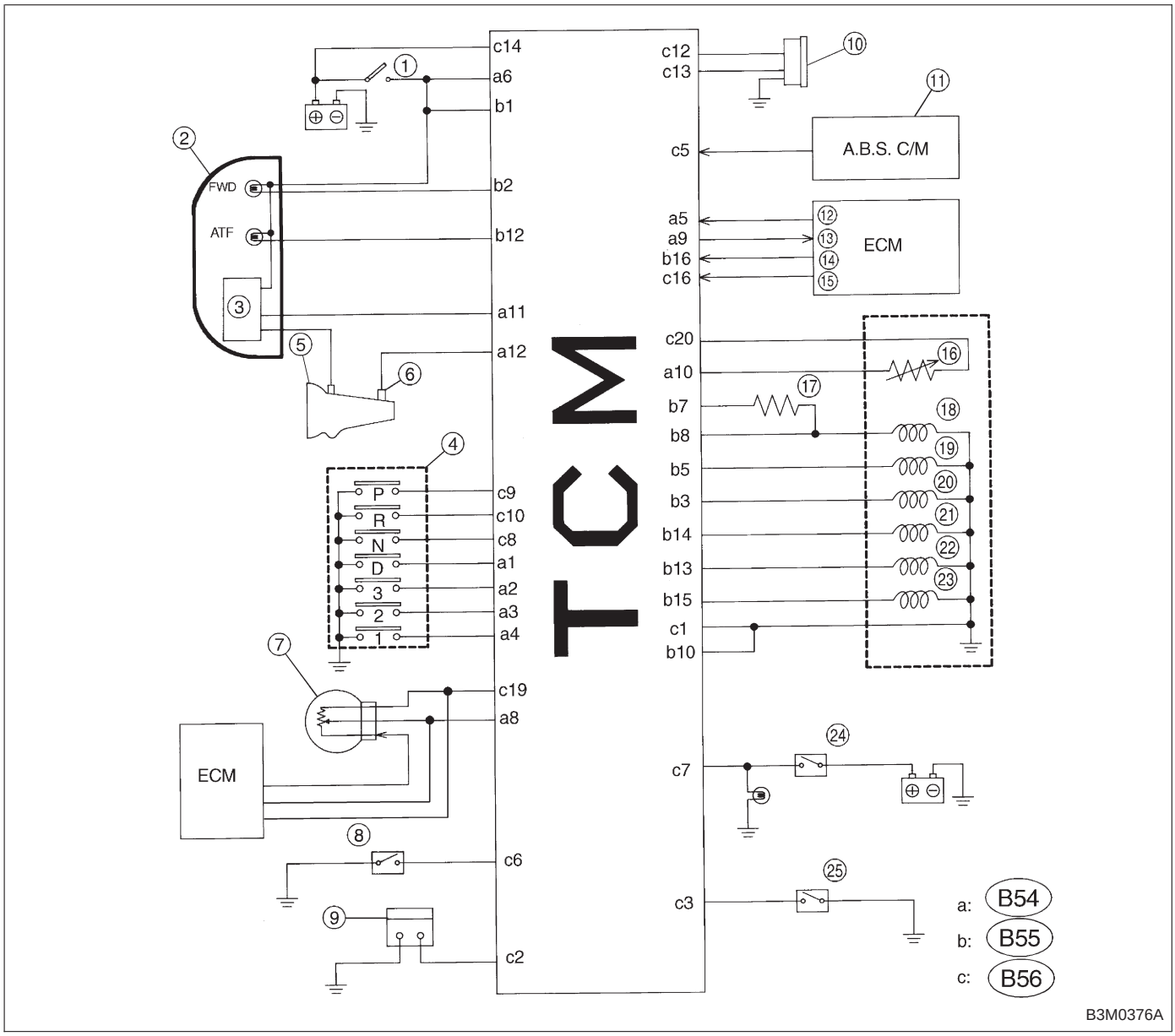
① Duty solenoid A
② Solenoid 2
③ Solenoid 1
④ Solenoid 3
⑤ Duty solenoid B
⑥ ATF temperature sensor
⑦ Duty solenoid C (AWD)





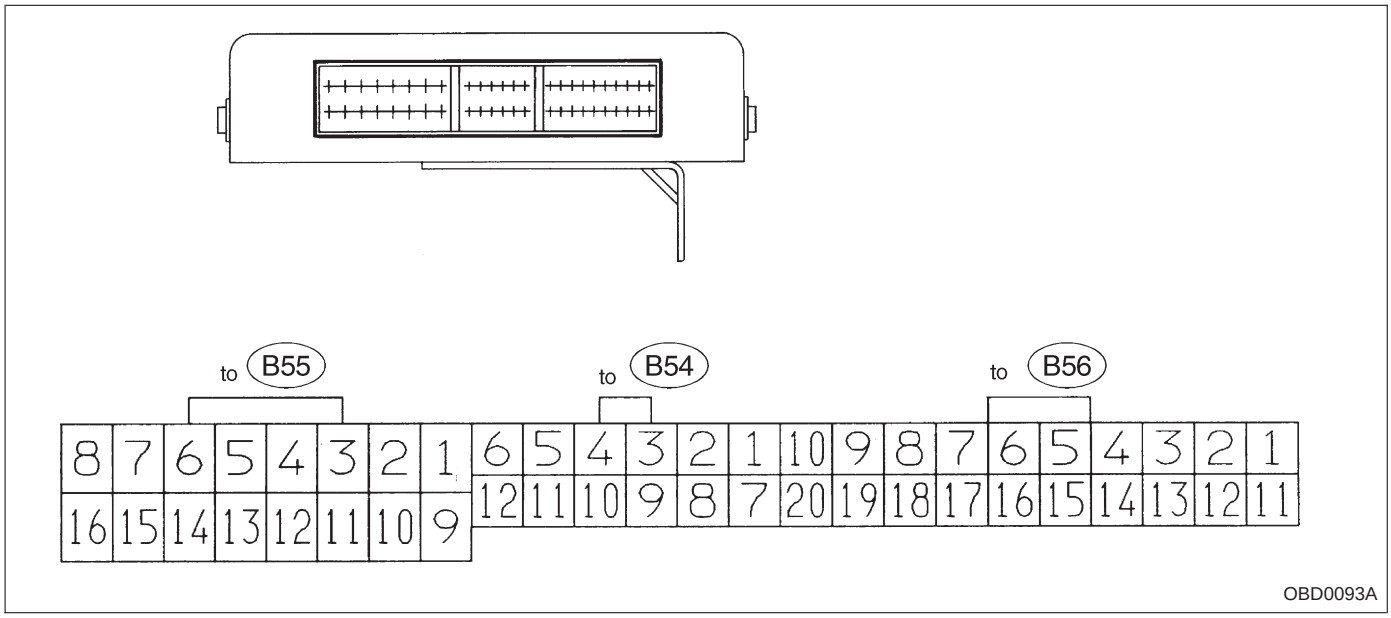


4. Schematic



① Ignition switch
② Combination meter
③ Speedometer circuit
④ Inhibitor switch
⑤ Vehicle speed sensor 2
⑥ Vehicle speed sensor 1
⑦ Throttle position sensor
⑧ Diagnosis switch
⑨ FWD switch (AWD)
⑩ Data link connector
⑪ ABS control module
⑫ Engine speed signal
⑬ Torque control signal
⑭ Torque control cut signal
⑮ Mass air flow signal
⑯ ATF temperature sensor
⑰ Dropping resistor
⑱ Duty solenoid A
⑲ Duty solenoid B
⑳ Duty solenoid C (AWD)
㉑ Shift solenoid 1
㉒ Shift solenoid 2
㉓ Shift solenoid 3
㉔ Brake switch
㉕ Cruise set switch

5. Transmission Control Module (TCM) I/O Signal



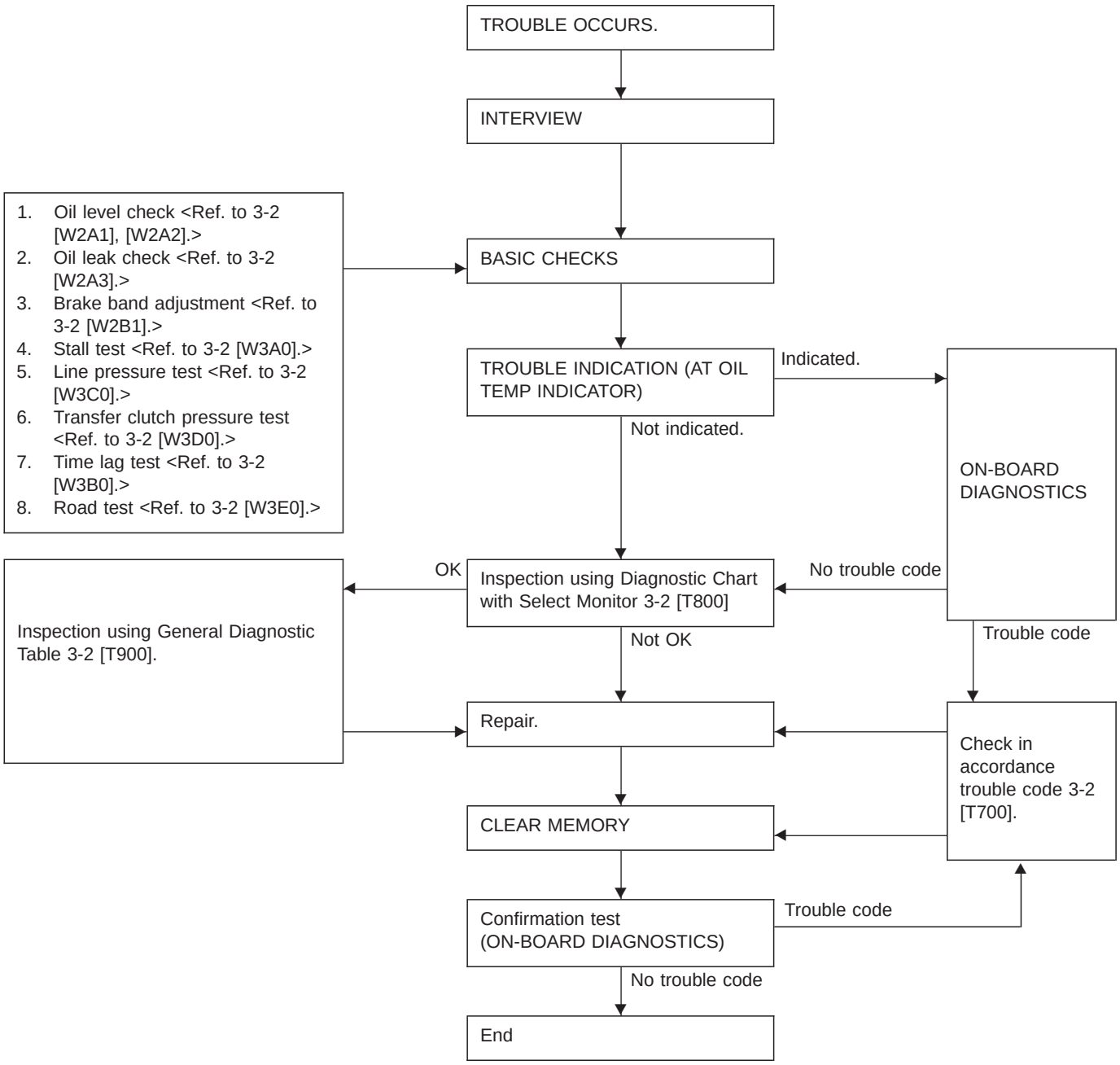
Check with ignition switch ON.

Content		Connector No.	Terminal No.	Measuring conditions	Voltage (V)
Back-up power supply		B56	14	Ignition switch OFF	10 — 16
Ignition power supply		B54	6	Ignition switch ON (with engine OFF)	10 — 16
		B55	1		
Inhibitor switch	“P” range switch	B56	9	Select lever in “P” range	Less than 1
				Select lever in any other than “P” range (except “N” range)	More than 8
	“N” range switch	B56	8	Select lever in “N” range	Less than 1
				Select lever in any other than “N” range (except “P” range)	More than 8
	“R” range switch	B56	10	Select lever in “R” range	Less than 1
				Select lever in any other than “R” range	More than 6
	“D” range switch	B54	1	Select lever in “D” range	Less than 1
				Select lever in any other than “D” range	More than 6
	“3” range switch	B54	2	Select lever in “3” range	Less than 1
				Select lever in any other than “3” range	More than 6
	“2” range switch	B54	3	Select lever in “2” range	Less than 1
				Select lever in any other than “2” range	More than 6
	“1” range switch	B54	4	Select lever in “1” range	Less than 1
				Select lever in any other than “1” range	More than 6
Diagnosis switch		B56	6	Diagnosis connector connected	Less than 1
				Diagnosis connector disconnected	More than 6
Brake switch		B56	7	Brake pedal depressed.	More than 10.5
				Brake pedal released.	Less than 1
ABS signal		B56	5	ABS switch ON	Less than 1
				ABS switch OFF	More than 6.5
AT diagnostic signal		B55	12	Ignition switch ON (With engine OFF)	Less than 1
				Ignition switch ON (With engine ON)	More than 10

Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Throttle position sensor	B54	8	Throttle fully closed.	0.5±0.2	—
			Throttle fully open.	4.6±0.3	
Throttle position sensor power supply	B56	19	Ignition switch ON (With engine OFF)	5.05±0.25	—
ATF temperature sensor	B54	10	ATF temperature 20°C (68°F)	3.45±0.55	2.1 — 2.9 k
			ATF temperature 80°C (176°F)	1.2±0.2	275 — 375
Vehicle speed sensor 1	B54	12	Vehicle stopped.	0	450 — 720
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)	
Vehicle speed sensor 2	B56	11	When vehicle is slowly moved at least 2 meters (7ft).	Less than 1↔More than 9	—
Engine speed signal	B54	5	Ignition switch ON (with engine OFF).	More than 10.5	—
			Ignition switch ON (with engine ON).	8 — 11	
Cruise set signal	B56	3	When cruise control is set (SET lamp ON).	Less than 1	—
			When cruise control is not set (SET lamp OFF).	More than 6.5	
Torque control signal	B55	16	Ignition switch ON	5±1	—
Torque control cut signal	B56	16	Ignition switch ON	6 — 9	—
Mass air flow signal	B54	9	Engine idling after warm-up	0.5 — 1.2	—
Shift solenoid 1	B55	14	1st or 4th gear	More than 9	20 — 32
			2nd or 3rd gear	Less than 1	
Shift solenoid 2	B55	13	1st or 2nd gear	More than 9	20 — 32
			3rd or 4th gear	Less than 1	
Shift solenoid 3	B55	15	Select lever in “N” range (with throttle fully closed).	Less than 1	20 — 32
			Select lever in “D” range (with throttle fully closed).	More than 9	
Duty solenoid A	B55	8	Throttle fully closed (with engine OFF) after warm-up.	1.5 — 4.0	2.0 — 4.5
			Throttle fully open (with engine OFF) after warm-up.	Less than 1	
Dropping resistor	B55	7	Throttle fully closed (with engine OFF) after warm-up.	More than 8.5	12 — 18
			Throttle fully open (with engine OFF) after warm-up.	Less than 1	
Duty solenoid B	B55	5	When lock up occurs.	More than 8.5	9 — 17
			When lock up is released.	Less than 0.5	
Duty solenoid C (AWD model only)	B55	3	Fuse on FWD switch	More than 8.5	9 — 17
			Fuse removed from FWD switch (with throttle fully open and with select lever in 1st gear).	Less than 0.5	
Sensor ground line 1	B54	7	—	0	Less than 1
Sensor ground line 2	B56	20	—	0	Less than 1
System ground line	B56	1	—	0	Less than 1
Power system ground line	B55	10	—	0	Less than 1
FWD switch (AWD model only)	B56	2	Fuse removed.	6 — 9.1	—
			Fuse installed.	Less than 1	

6. Diagnostic Chart for On-board Diagnostic System

A: BASIC DIAGNOSTICS PROCEDURE

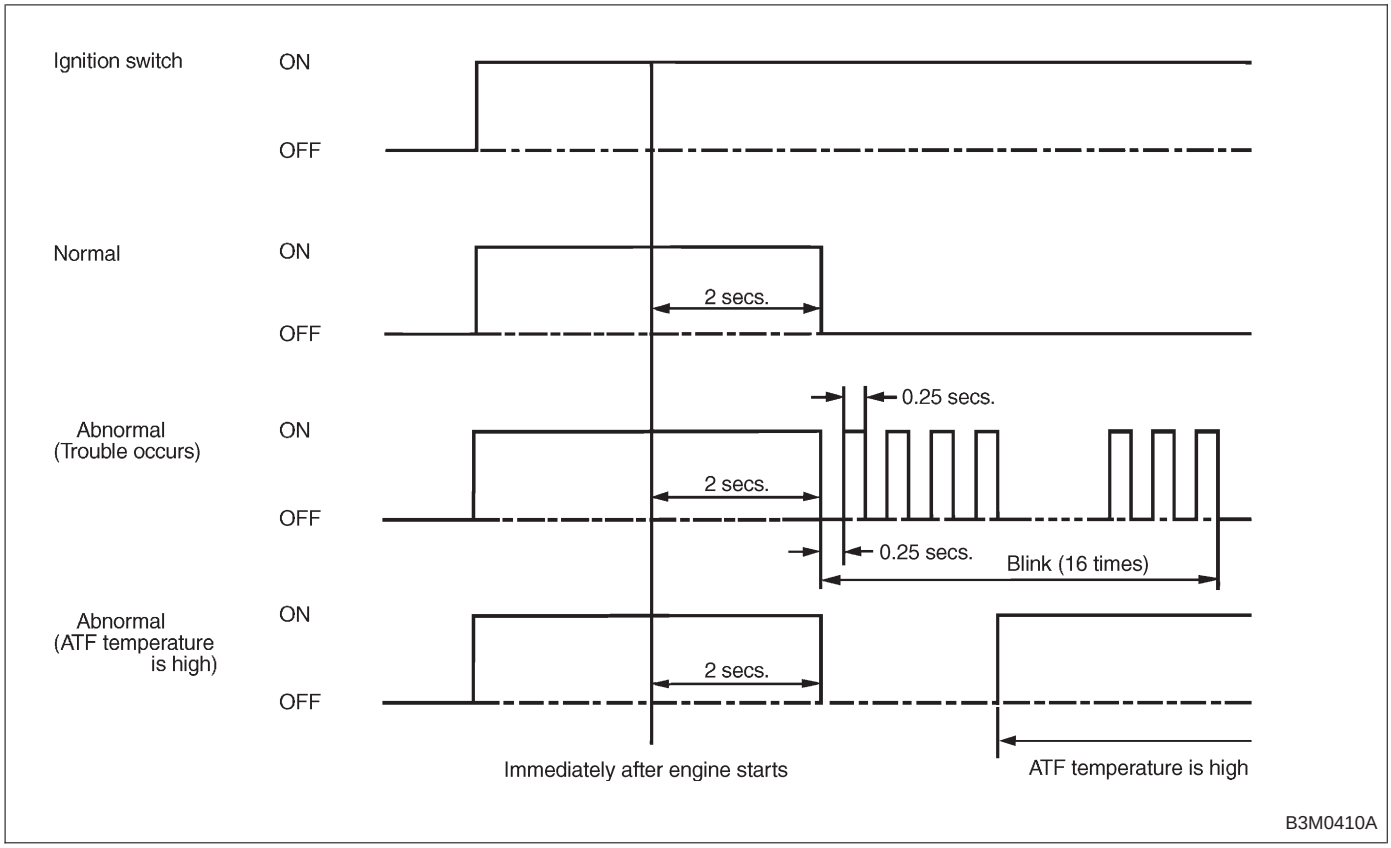


B: ABNORMAL DISPLAY ON AT OIL TEMP INDICATOR

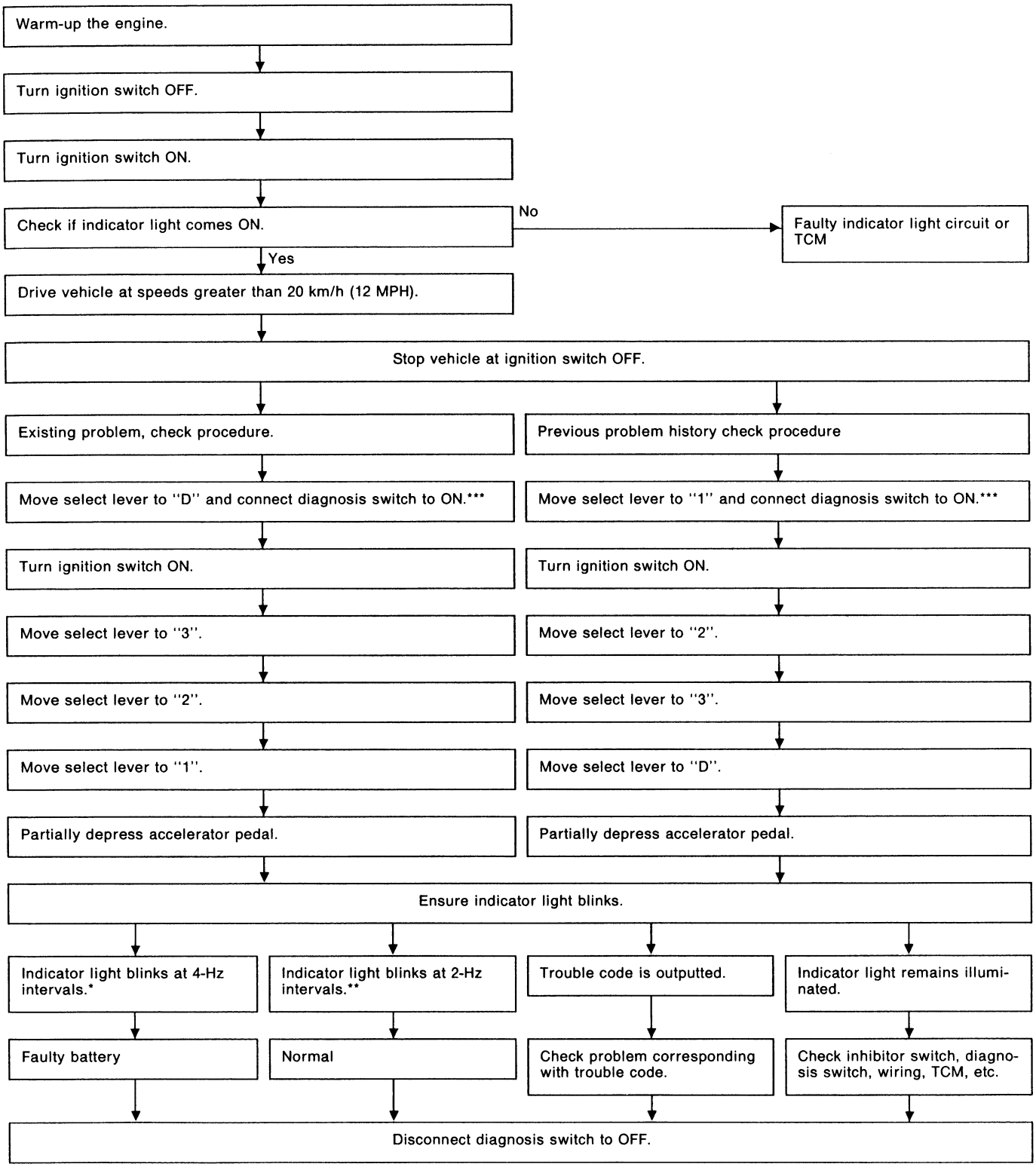
When any on-board diagnostic item is malfunctioning, the display on the AT OIL TEMP indicator blinks immediately after the engine starts.
The malfunctioning part or unit can be determined by a trouble code during on-board diagnostic operation. Problems which occurred previously can also be identified through the memory function.
If the AT OIL TEMP indicator does not show a problem (although a problem is occurring), the problem can be determined by checking the performance characteristics of each sensor using the select monitor.
Indicator signal is as shown in the figure.

WARNING:

Warning can be noticed only when the engine is initially started.



C: ON-BOARD DIAGNOSTICS



* : Blinks every 0.125 (1/8) seconds (until ignition switch is turned OFF).
** : Blinks every 0.25 (1/4) seconds (until ignition switch is turned OFF).
***: Plug in diagnosis terminal to diagnosis connector No. 5 located below instrument lower cover.

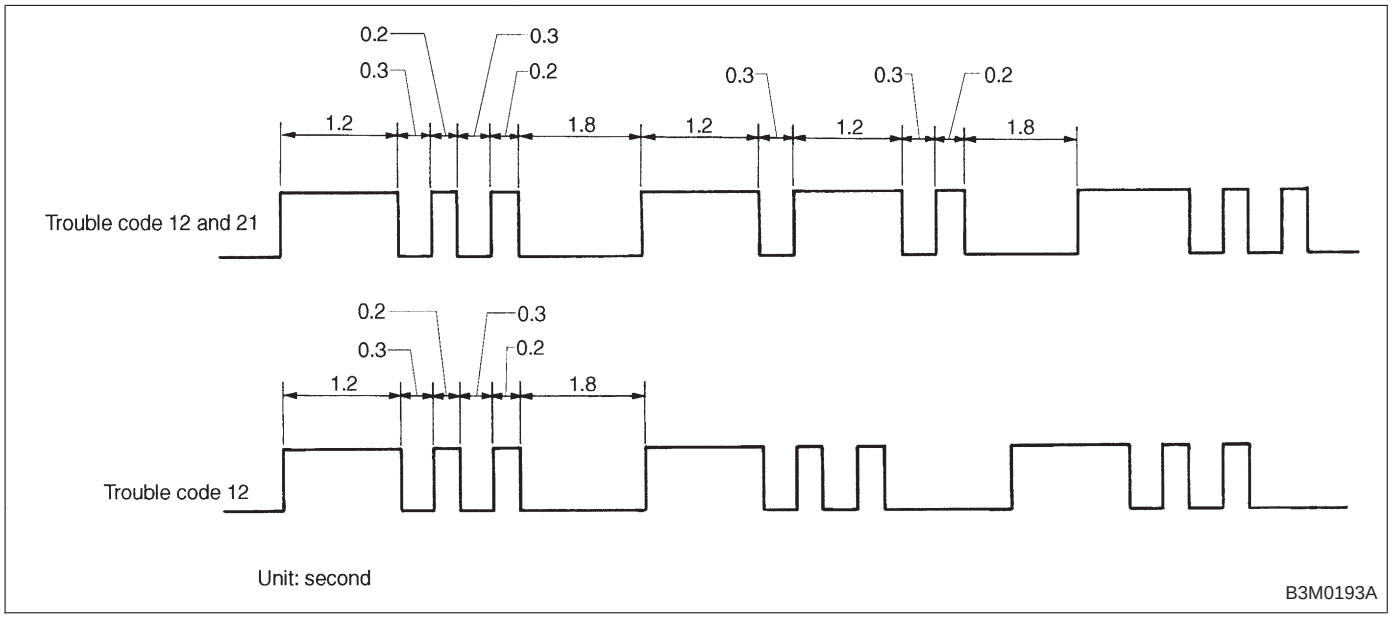
D: LIST OF TROUBLE CODE

1. TROUBLE CODE

Trouble code	Item	Content of diagnosis	Abbr. (Select monitor)	Page
11	Duty solenoid A	Detects open or shorted drive circuit, as well as valve seizure.	PLDTY	16
12	Duty solenoid B	Detects open or shorted drive circuit, as well as valve seizure.	LUDTY	20
13	Shift solenoid 3	Detects open or shorted drive circuit, as well as valve seizure.	OVR	24
14	Shift solenoid 2	Detects open or shorted drive circuit, as well as valve seizure.	SFT2	26
15	Shift solenoid 1	Detects open or shorted drive circuit, as well as valve seizure.	SFT1	28
21	ATF temperature sensor	Detects open or shorted input signal circuit.	ATFT	30
22	Mass air flow signal	Detects open or shorted input signal circuit.	AFM	33
23	Engine speed signal	Detects open or shorted input signal circuit.	EREV	35
24	Duty solenoid C	Detects open or shorted drive circuit, as well as valve seizure.	4WDTY	37
25	Torque control signal	Detects open or shorted input signal circuit.	TQ.CT	39
31	Throttle position sensor	Detects open or shorted input signal circuit.	THV	41
32	Vehicle speed sensor 1	Detects open or shorted input signal circuit.	VSP1	44
33	Vehicle speed sensor 2	Detects open or shorted input signal circuit.	VSP2	48

2. HOW TO READ TROUBLE CODE OF INDICATOR LIGHT

The AT OIL TEMP indicator light flashes the code corresponding to the faulty part.
The long segment (1.2 sec on) indicates a “ten”, and the short segment (0.2 sec on) signifies a “one”.



E: CLEAR MEMORY

Current trouble codes shown on the display are cleared by turning the ignition switch OFF after conducting on-board diagnostic operation. Previous trouble codes, however, cannot be cleared since they are stored in the TCM memory which is operating on the back-up power supply. These trouble codes can be cleared by removing the specified fuse (located under the right lower portion of the instrument panel).

CLEAR MEMORY:

Removal of No. 14 fuse (for at least one minute)

- The No. 14 fuse is located in the line to the memory back-up power supply of the TCM and ABS/TCS control module. Removal of this fuse clears the previous trouble codes stored in the TCM and ABS/TCS control module memory.
- Be sure to remove the No. 14 fuse for at least the specified length of time. Otherwise, trouble codes may not be cleared.

7. Diagnostic Chart with Trouble Code

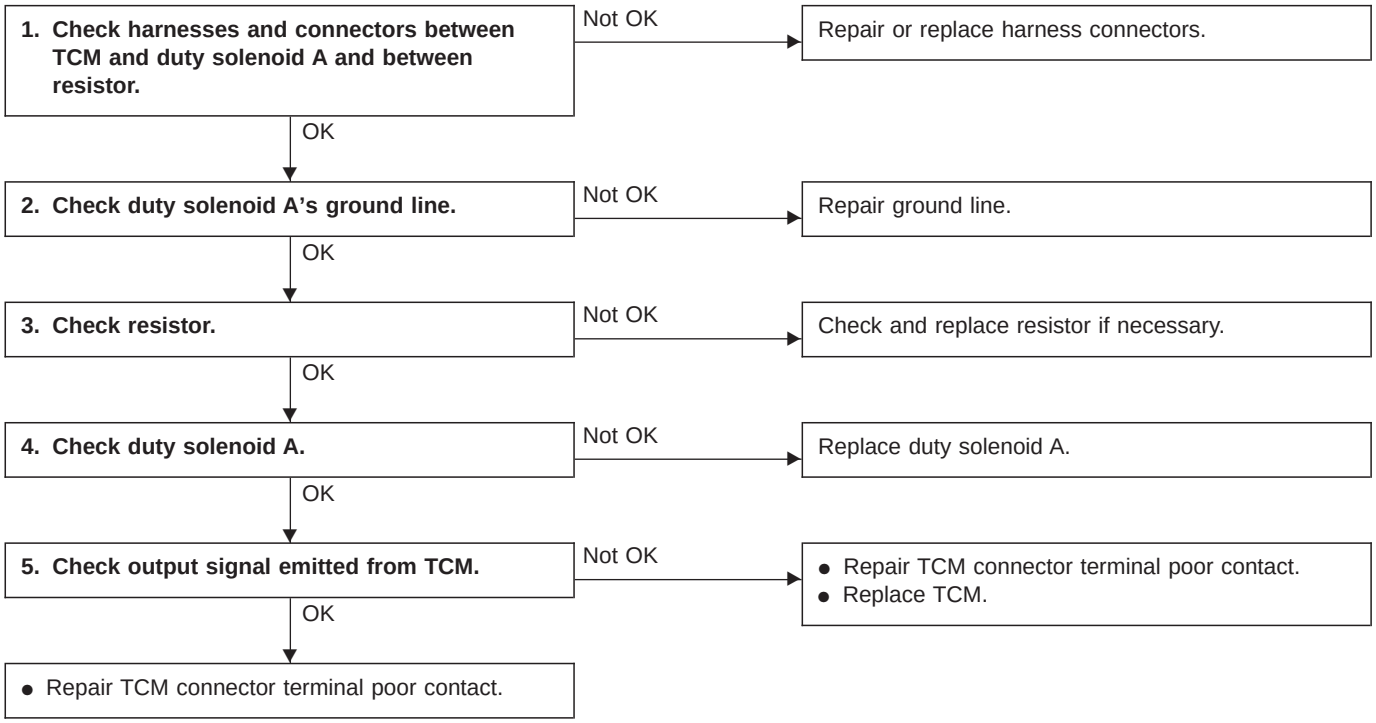
A: TROUBLE CODE 11 — DUTY SOLENOID A —

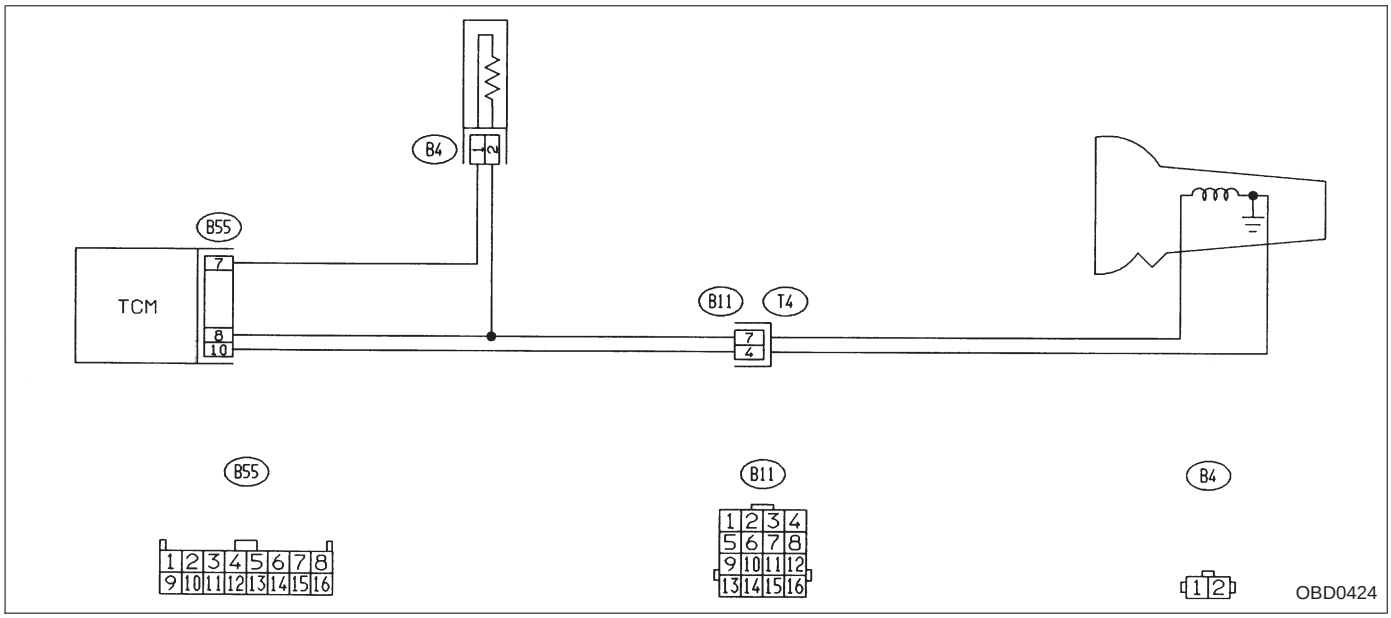
DIAGNOSIS:

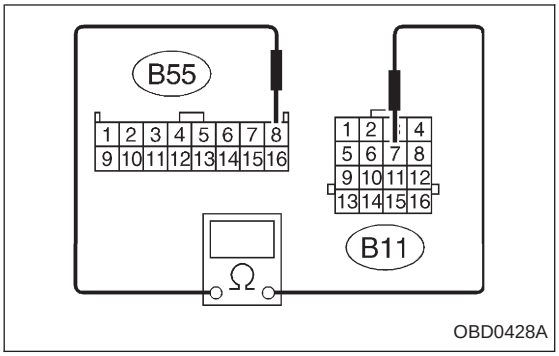
Output signal circuit of duty solenoid A or resistor is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock



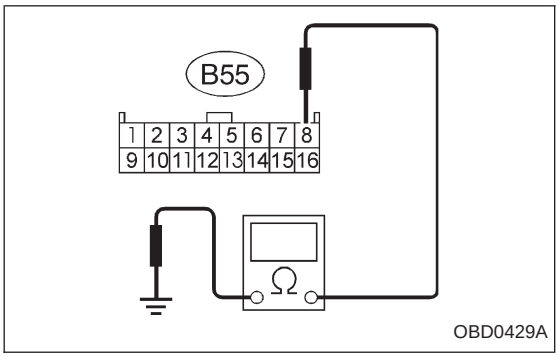




1. CHECK HARNESSES AND CONNECTORS BETWEEN TCM AND DUTY SOLENOID A AND BETWEEN RESISTOR.

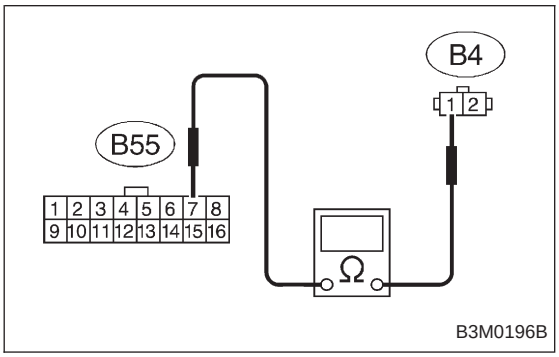
1) Turn ignition switch to OFF.
2) Disconnect connectors from TCM, transmission and resistor.
3) Measure resistance of harness connector between TCM and transmission.

Connector & terminal / Specified resistance:
(B55) No. 8 — (B11) No. 7 / 1 Ω, or less



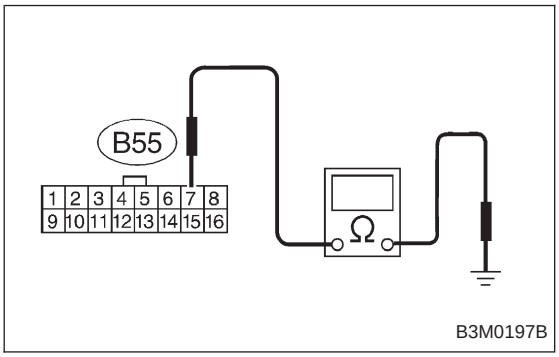
4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

Connector & terminal / Specified resistance:
(B55) No. 8 — Body / 1 MΩ, or more



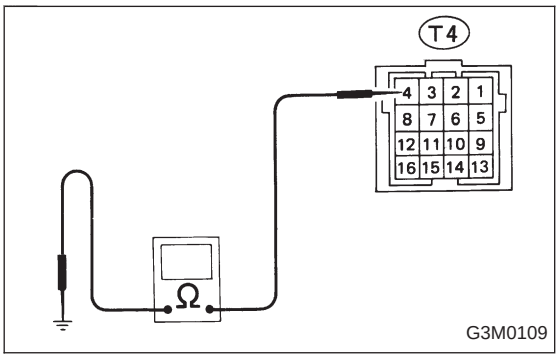
5) Measure resistance of harness connector between TCM and resistor connector.

Connector & terminal / Specified resistance:
(B55) No. 7 — (B4) No. 1 / 1 Ω, or less



6) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

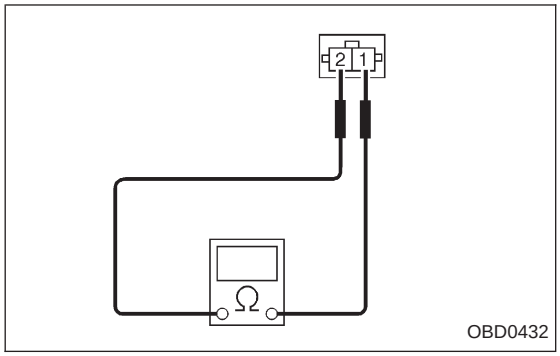
Connector & terminal / Specified resistance:
(B55) No. 7 — Body / 1 MΩ, or more



2. CHECK DUTY SOLENOID A's GROUND LINE.

Measure resistance between transmission connector receptacle (on transmission) and transmission case.

Connector & terminal / Specified resistance:
(T4) No. 4 — Transmission / 1 Ω, or less

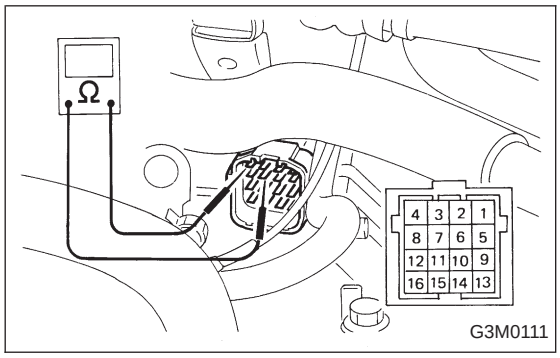


3. CHECK RESISTOR.

Measure resistance between resistor terminals.

Specified resistance:

(B4) No. 1 — No. 2 / 9 — 15 Ω

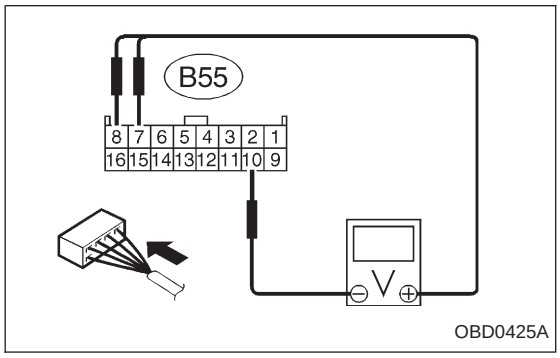


4. CHECK DUTY SOLENOID A.

Measure resistance between transmission connector receptacle (on transmission) terminals.

Connector & terminal / Specified resistance:

(T4) No. 7 — No. 4 / 1.5 — 4.5 Ω

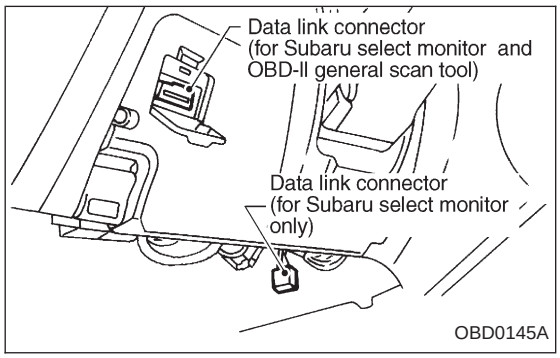


5. CHECK OUTPUT SIGNAL EMITTED FROM TCM.

1) Connect connectors to TCM, transmission and resistor.
2) Start and warm-up the engine and transmission.
3) Ignition switch ON (Engine OFF).
4) Move selector lever to “N”.
5) Measure voltage between TCM connector and body while opening and closing throttle position sensor.

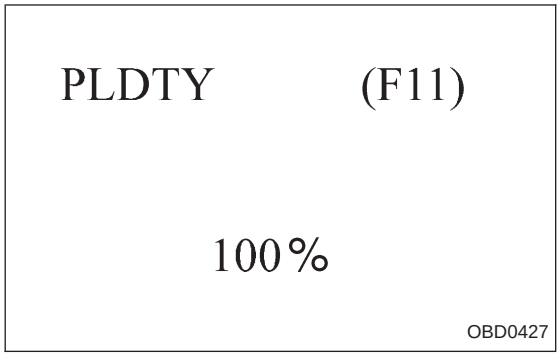
Connector & terminal / Specified voltage:

(B55) No. 8 — No. 10 / 1.5 — 4.0 V (Throttle is fully closed.)
(B55) No. 8 — No. 10 / 1 V, or less (Throttle is fully open.)
(B55) No. 7 — No. 10 / 5 — 14 V (Throttle is fully closed.)
(B55) No. 7 — No. 10 / 1 V, or less (Throttle is fully open.)



- Using Subaru select monitor:

  (1) Connect connectors to TCM, transmission and resistor.
  (2) Turn ignition switch to OFF.
  (3) Connect the Subaru select monitor to data link connector.
  (4) Turn ignition switch to ON and Subaru select monitor switch to ON.



(5) Start and warm-up the engine and transmission.
(6) Stop the engine and turn ignition switch to ON (Engine OFF).
(7) Move selector lever to “N”.
(8) Read data on Subaru select monitor.
(9) Designate mode using function key.

Function mode: F11

SPECIFIED DATA:

- ***100% (Throttle is fully closed.)***
- ***15% (Throttle is fully open.)***

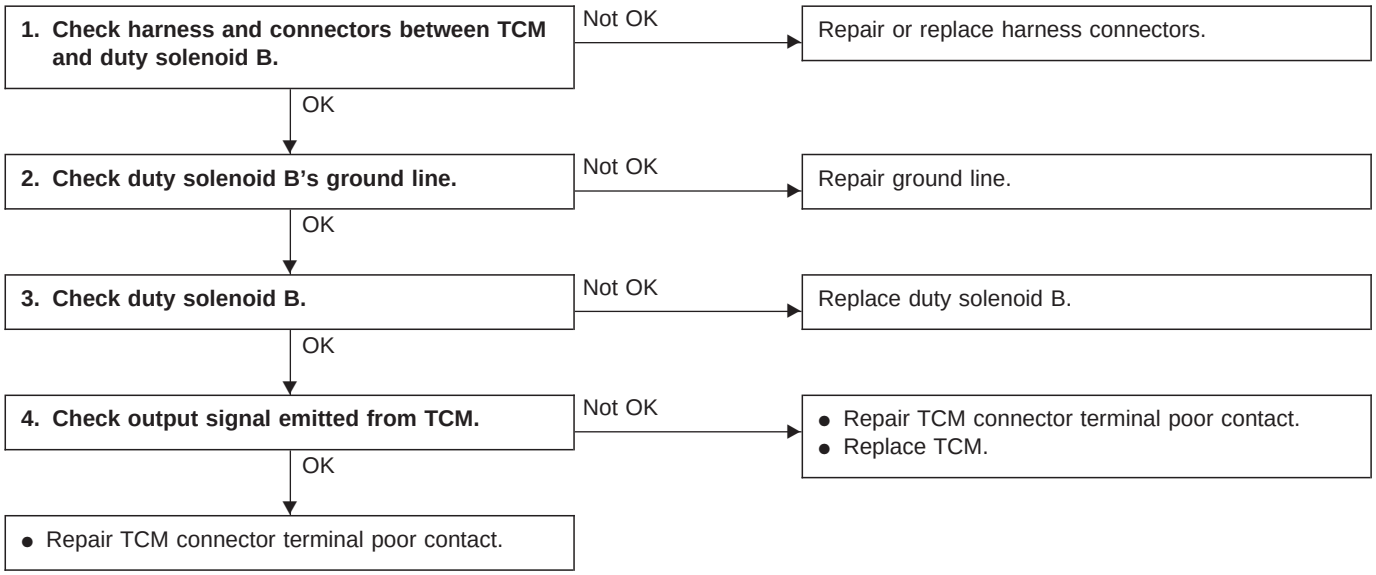
B: TROUBLE CODE 12 — DUTY SOLENOID B —

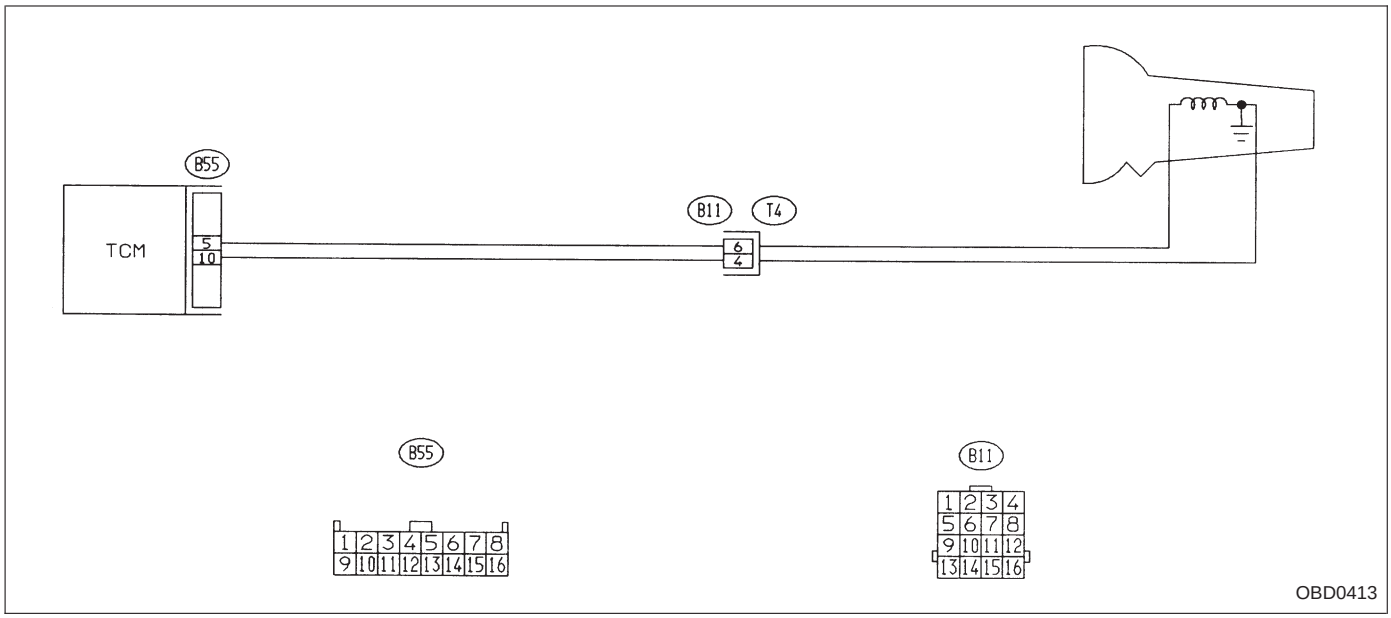
DIAGNOSIS:

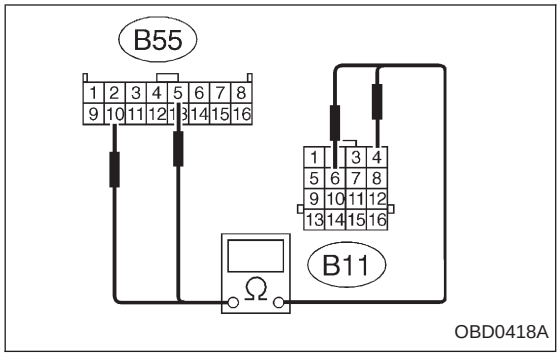
Output signal circuit of duty solenoid B is open or shorted.

TROUBLE SYMPTOM:

No “locking-up” (after engine warm-up)



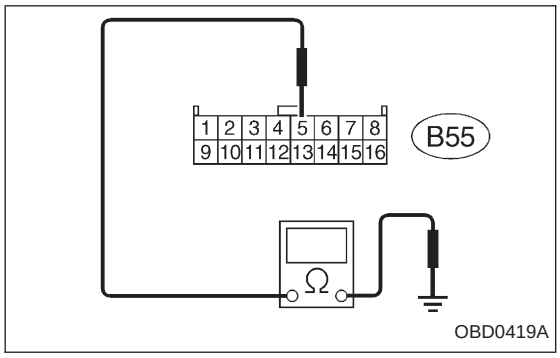




1. CHECK HARNESS AND CONNECTORS BETWEEN TCM AND DUTY SOLENOID B.

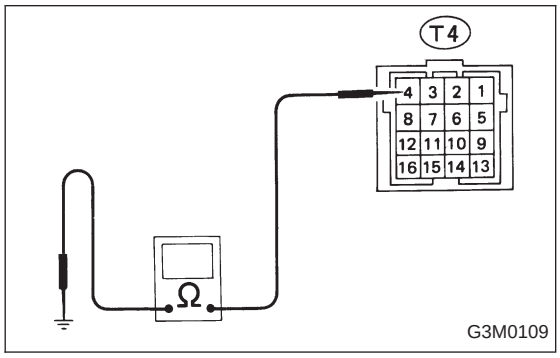
1) Turn ignition switch to OFF.
2) Disconnect connectors from TCM and transmission.
3) Measure resistance of harness connector between TCM and transmission connector.

Connector & terminal / Specified resistance:
(B55) No. 5 — (B11) No. 6 / 1 Ω, or less
(B55) No. 10 — (B11) No. 4 / 1 Ω, or less



4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

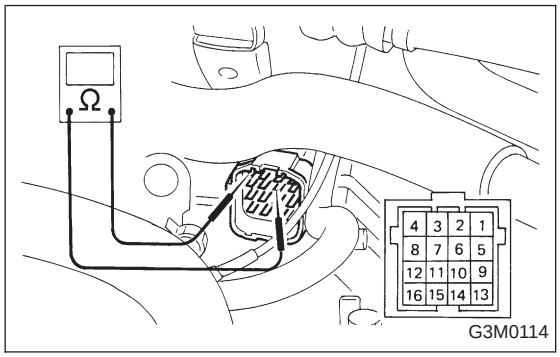
Connector & terminal / Specified resistance:
(B55) No. 5 — Body / 1 MΩ, or more



2. CHECK DUTY SOLENOID B's GROUND LINE.

Measure resistance between transmission connector receptacle and transmission case.

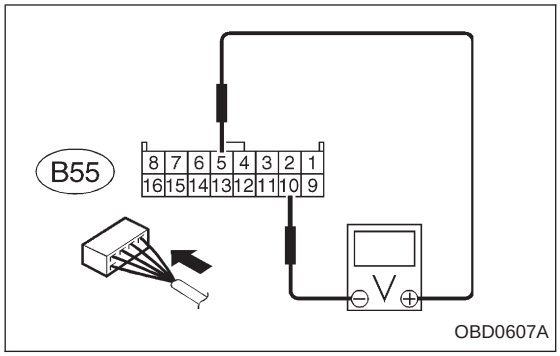
Connector & terminal / Specified resistance:
(T4) No. 4 — Transmission / 1 Ω, or less



3. CHECK DUTY SOLENOID B.

Measure resistance between transmission connector receptacle's terminals.

Connector & terminal / Specified resistance:
(T4) No. 6 — No. 4 / 9 — 17 Ω



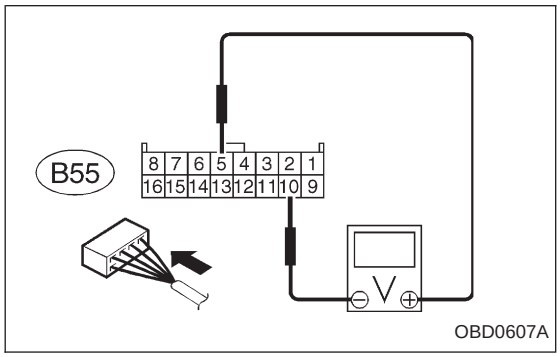
4. CHECK OUTPUT SIGNAL EMITTED FROM TCM.

1) Connect connectors to TCM and transmission.
2) Lift-up the vehicle or set the vehicle on free roller.

CAUTION:
On AWD models, raise all wheels off floor.

3) Start and warm-up the engine and transmission.
4) Push the TCS OFF switch to ON. (With TCS models)
5) Move selector lever to “D” and slowly increase vehicle speed to 75 km/h (47 MPH).
6) Measure voltage between TCM connector terminals.

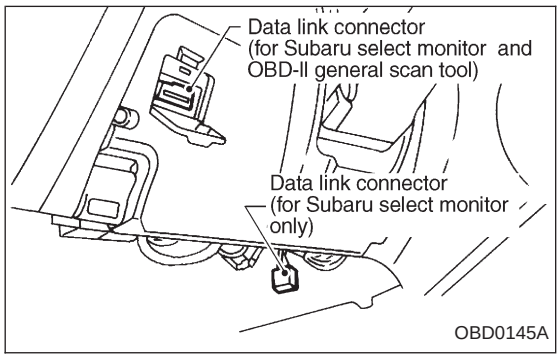
Connector & terminal / Specified voltage:
(B55) No. 5 — No. 10 / 8.5 V, or more (when wheels are locked-up.)



7) Return the engine to idling speed and move selector lever to “N”.
8) Measure voltage between TCM connector terminals.

Connector & terminal / Specified voltage:
(B55) No. 5 — No. 10 / 0.5 V, or less

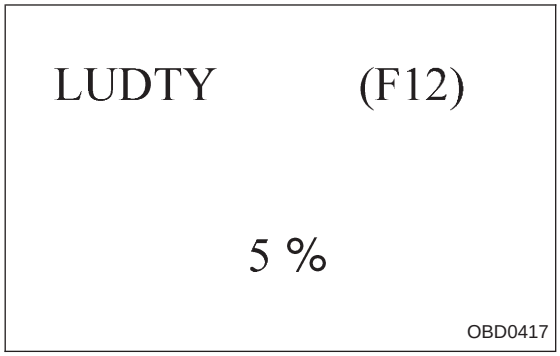
NOTE:
The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.
<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>



- Using Subaru select monitor:
  (1) Connect connectors to TCM and transmission.
  (2) Lift-up the vehicle or set the vehicle on free roller.

CAUTION:
On AWD models, raise all wheels off floor.

  (3) Turn ignition switch to OFF.
  (4) Connect the Subaru select monitor to data link connector.
  (5) Turn ignition switch to ON and Subaru select monitor switch to ON.



(6) Start and warm-up the engine and transmission.
(7) Push the TCS OFF switch to ON. (With TCS models)
(8) Designate mode using function key.

Function mode: F12

(9) Move selector lever to “D” and slowly increase vehicle speed to 75 km/h (47 MPH).
(10) Read data on Subaru select monitor.

SPECIFIED DATA:

- ***95% (Wheel locked-up)***
- ***5% (Released)***

NOTE:
The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.
<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>

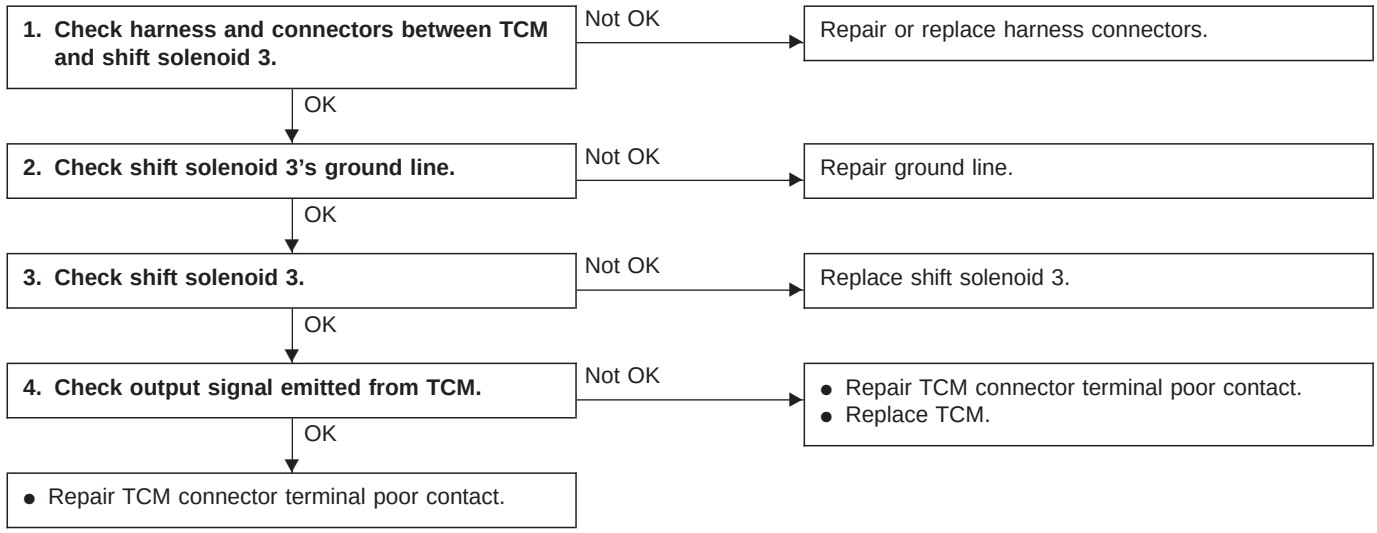
C: TROUBLE CODE 13 — SHIFT SOLENOID 3 —

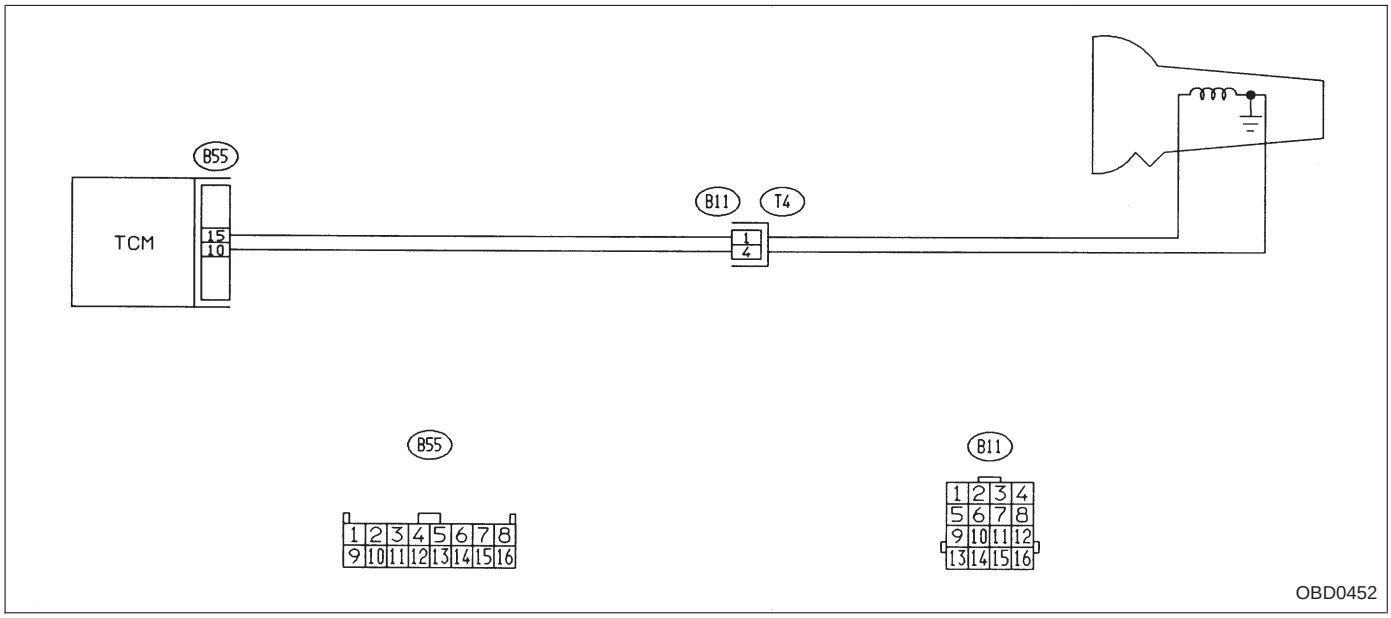
DIAGNOSIS:

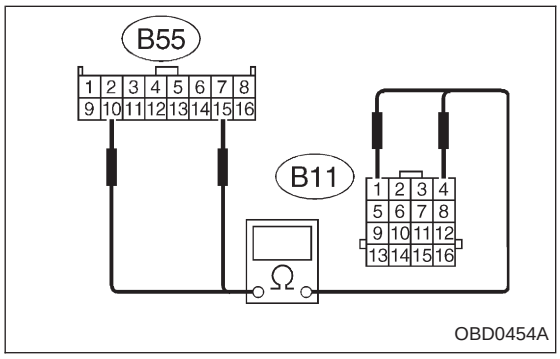
Output signal circuit of shift solenoid 3 is open or shorted.

TROUBLE SYMPTOM:

Ineffective engine brake with shift lever in “3”





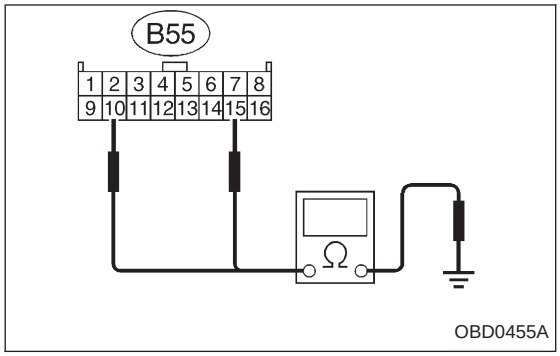


1. CHECK HARNESS AND CONNECTORS BETWEEN TCM AND SHIFT SOLENOID 3.

1) Turn ignition switch to OFF.
2) Disconnect connectors from TCM and transmission.
3) Measure resistance of harness connector between TCM and transmission connector.

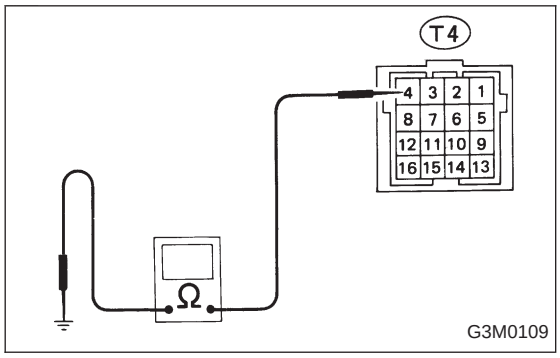
Connector & terminal / Specified resistance:

(B55) No. 15 — (B11) No. 1 / 1 Ω, or less
(B55) No. 10 — (B11) No. 4 / 1 Ω, or less



4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

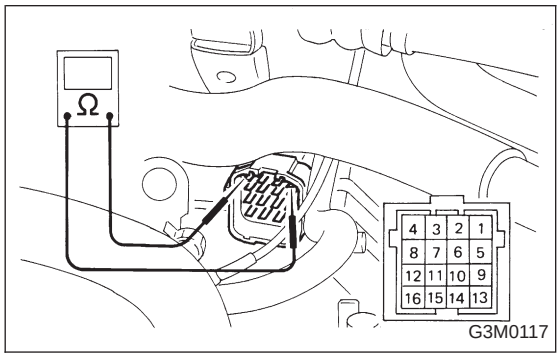
Connector & terminal / Specified resistance:
(B55) No. 15 — Body / 1 MΩ, or more
(B55) No. 10 — Body / 1 MΩ, or more



2. CHECK SHIFT SOLENOID 3's GROUND LINE.

Measure resistance between transmission connector receptacle and transmission case.

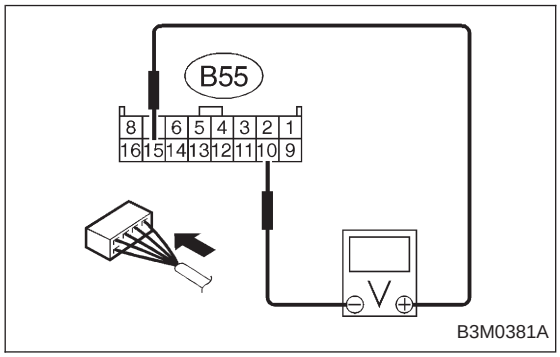
Connector & terminal / Specified resistance:
(T4) No. 4 — Transmission / 1 Ω, or less



3. CHECK SHIFT SOLENOID 3.

Measure resistance between transmission connector receptacle's terminals.

Connector & terminal / Specified resistance:
(T4) No. 1 — No. 4 / 20 — 32 Ω



4. CHECK OUTPUT SIGNAL EMITTED FROM TCM.

1) Connect connectors to TCM and transmission.
2) Lift-up or raise the vehicle and support with safety stands.

CAUTION:
On AWD models, raise all wheels off ground.

3) Start and warm-up the engine and transmission.
4) Idle the engine.
5) Move selector lever to "D".
6) Measure voltage between TCM connector terminals.

Connector & terminal / Specified voltage:
(B55) No. 15 — No. 10 / 9 V, or more

NOTE:
The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.
<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>

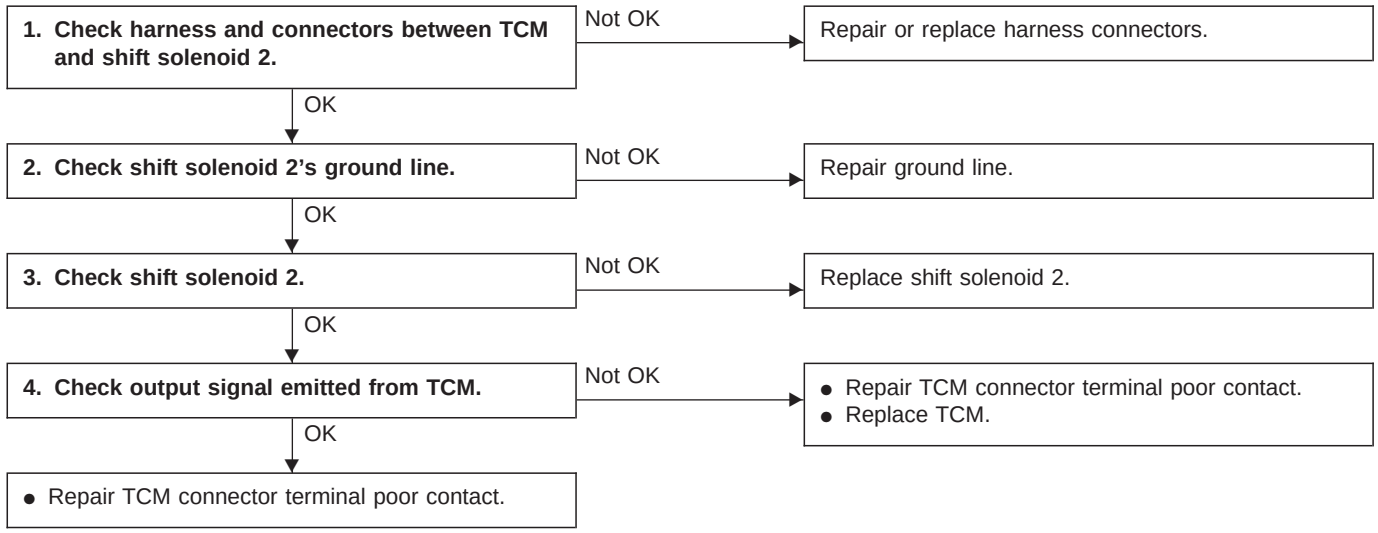
D: TROUBLE CODE 14 — SHIFT SOLENOID 2 —

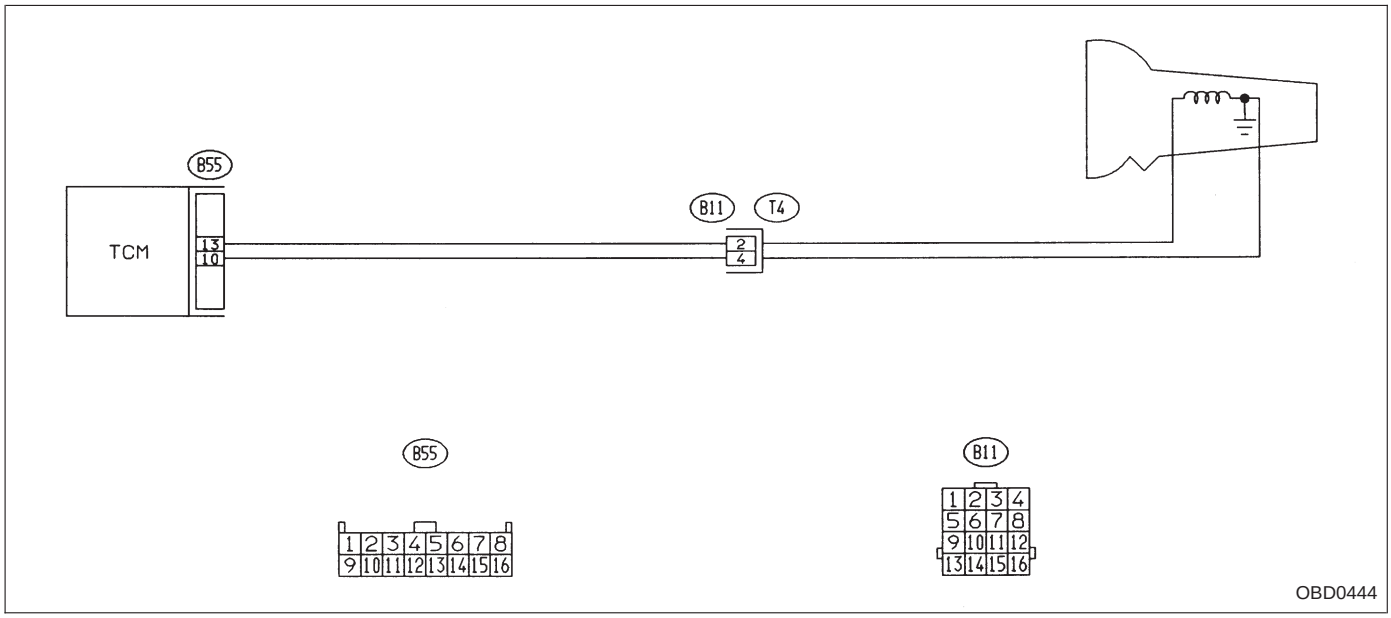
DIAGNOSIS:

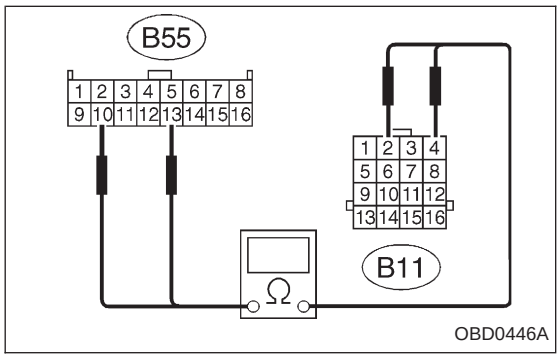
Output signal circuit of shift solenoid 2 is open or shorted.

TROUBLE SYMPTOM:

No shift





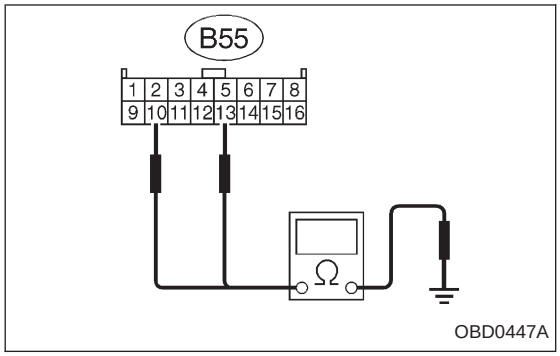


1. CHECK HARNESS AND CONNECTORS BETWEEN TCM AND SHIFT SOLENOID 2.

1) Turn ignition switch to OFF.
2) Disconnect connectors from TCM and transmission.
3) Measure resistance of harness connector between TCM and transmission connector.

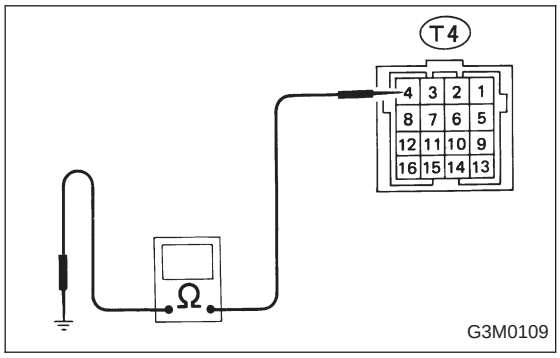
Connector & terminal / Specified resistance:

(B55) No. 13 — (B11) No. 2 / 1 Ω, or less
(B55) No. 10 — (B11) No. 4 / 1 Ω, or less



4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

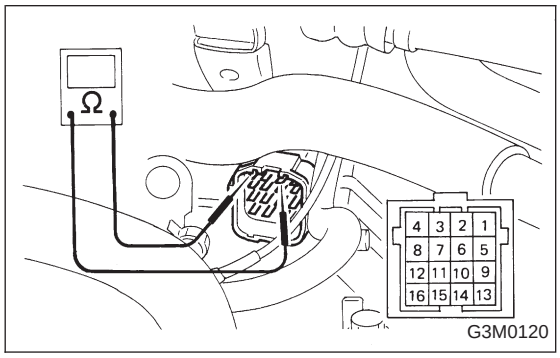
Connector & terminal / Specified resistance:
(B55) No. 13 — Body / 1 MΩ, or more
(B55) No. 10 — Body / 1 MΩ, or more



2. CHECK SHIFT SOLENOID 2's GROUND LINE.

Measure resistance between transmission connector receptacle and transmission case.

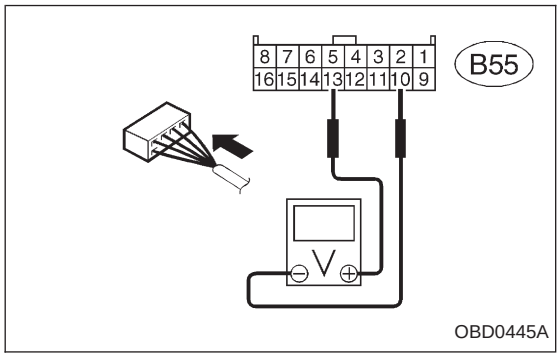
Connector & terminal / Specified resistance:
(T4) No. 4 — Transmission / 1 Ω, or less



3. CHECK SHIFT SOLENOID 2.

Measure resistance between transmission connector receptacle's terminals.

Connector & terminal / Specified resistance:
(T4) No. 2 — No. 4 / 20 — 32 Ω



4. CHECK OUTPUT SIGNAL EMITTED FROM TCM.

1) Connect connectors to TCM and transmission.
2) Lift-up or raise the vehicle and support with safety stands.

CAUTION:
On AWD models, raise all wheels off ground.

3) Start and warm-up the engine and transmission.
4) Idle the engine.
5) Move selector lever to "D".
6) Measure voltage between TCM connector terminals.

Connector & terminal / Specified voltage:
(B55) No. 13 — No. 10 / 9 V, or more

NOTE:
The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.
<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>

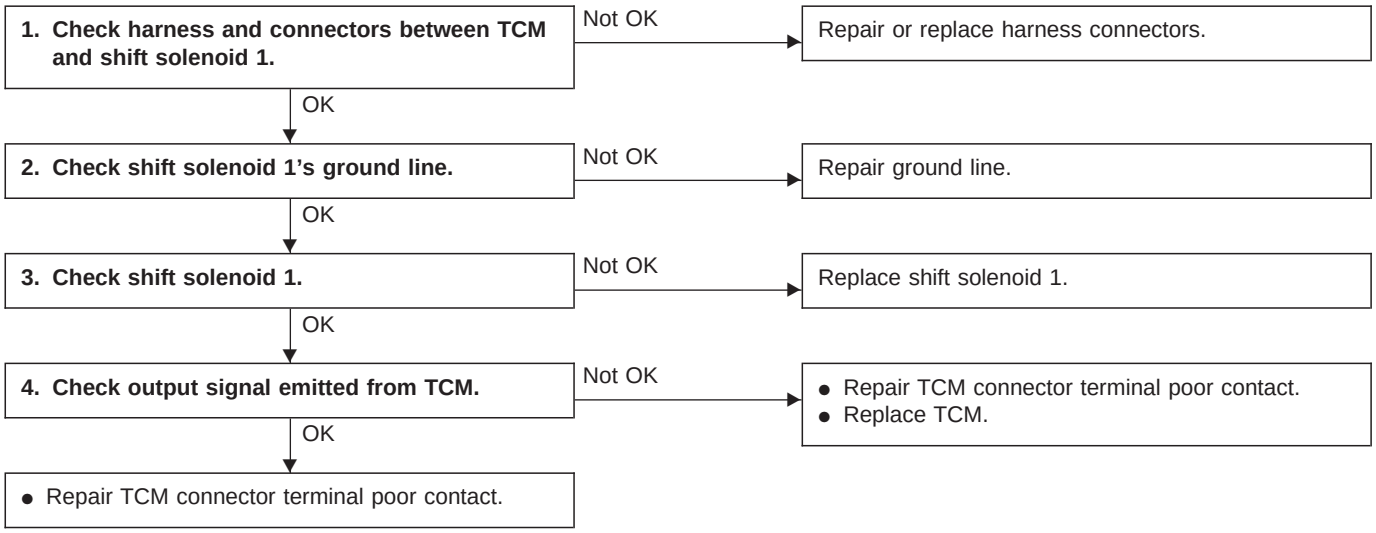
E: TROUBLE CODE 15 — SHIFT SOLENOID 1 —

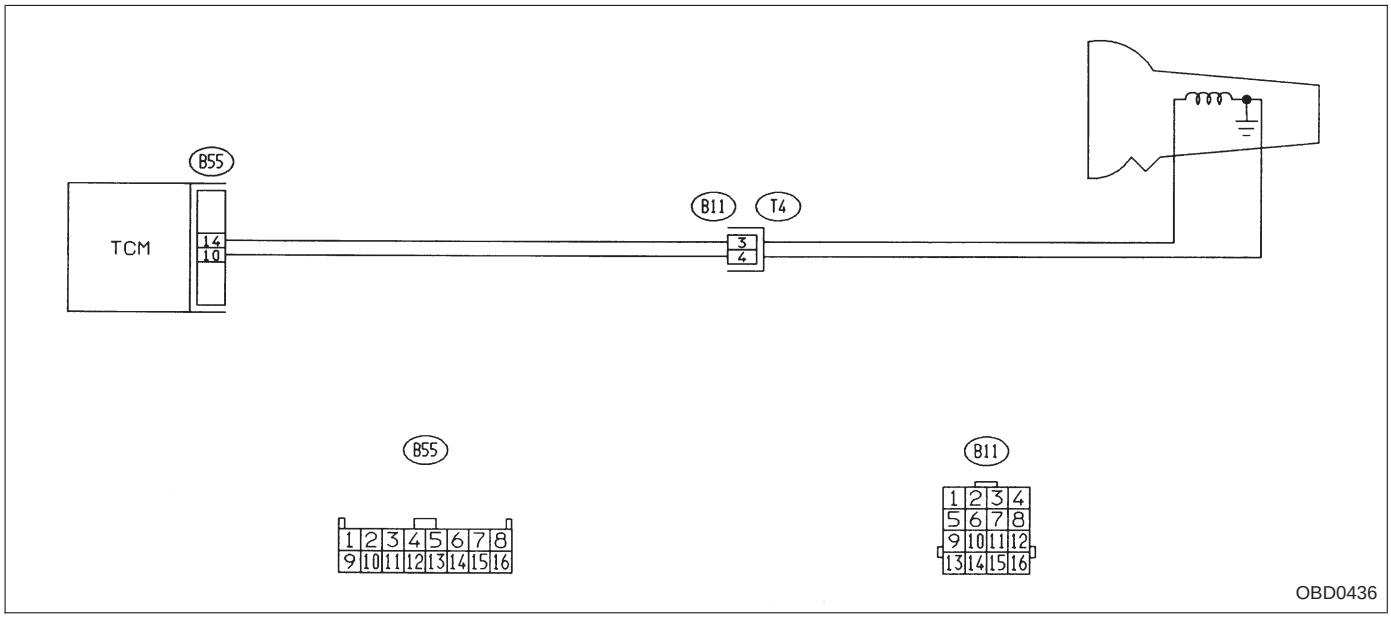
DIAGNOSIS:

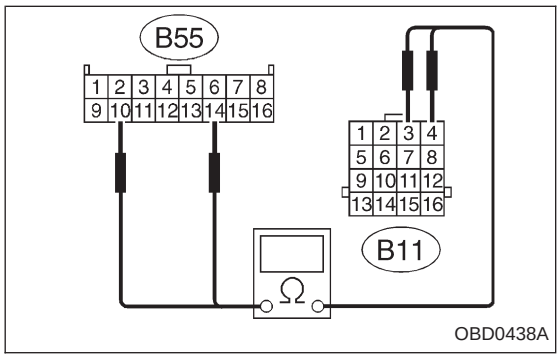
Output signal circuit of shift solenoid 1 is open or shorted.

TROUBLE SYMPTOM:

No shift





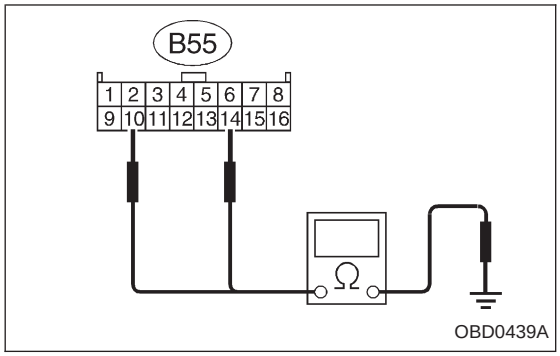


1. CHECK HARNESS AND CONNECTORS BETWEEN TCM AND SHIFT SOLENOID 1.

1) Turn ignition switch to OFF.
2) Disconnect connectors from TCM and transmission.
3) Measure resistance of harness connector between TCM and transmission connector.

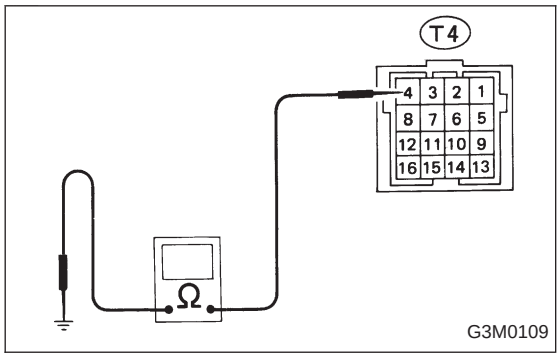
Connector & terminal / Specified resistance:

(B55) No. 14 — (B11) No. 3 / 1 Ω, or less
(B55) No. 10 — (B11) No. 4 / 1 Ω, or less



4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

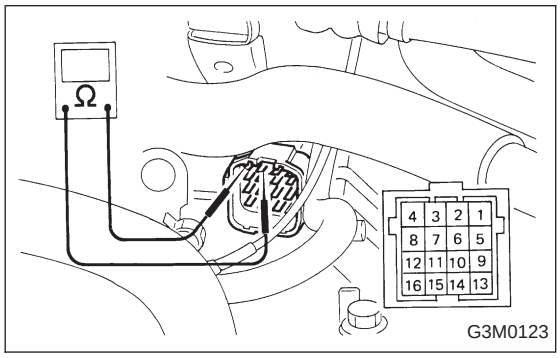
Connector & terminal / Specified resistance:
(B55) No. 14 — Body / 1 MΩ, or more
(B55) No. 10 — Body / 1 MΩ, or more



2. CHECK SHIFT SOLENOID 1's GROUND LINE.

Measure resistance between transmission connector receptacle and transmission case.

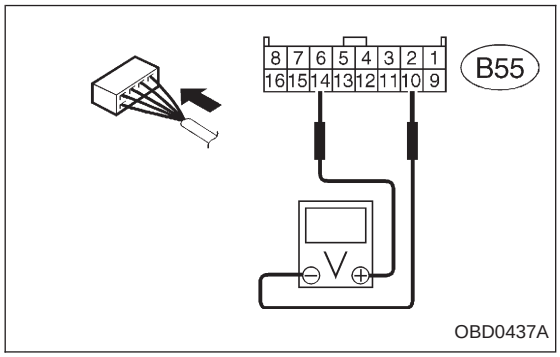
Connector & terminal / Specified resistance:
(T4) No. 4 — Transmission / 1 Ω, or less



3. CHECK SHIFT SOLENOID 1.

Measure resistance between transmission connector receptacle's terminals.

Connector & terminal / Specified resistance:
(T4) No. 3 — No. 4 / 20 — 32 Ω



4. CHECK OUTPUT SIGNAL EMITTED FROM TCM.

1) Connect connectors to TCM and transmission.
2) Lift-up or raise the vehicle and support with safety stands.

CAUTION:
On AWD models, raise all wheels off ground.

3) Start and warm-up the engine and transmission.
4) Idle the engine.
5) Move selector lever to "D".
6) Measure voltage between TCM connector terminals.

Connector & terminal / Specified voltage:
(B55) No. 14 — No. 10 / 9 V, or more

NOTE:
The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.
<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>

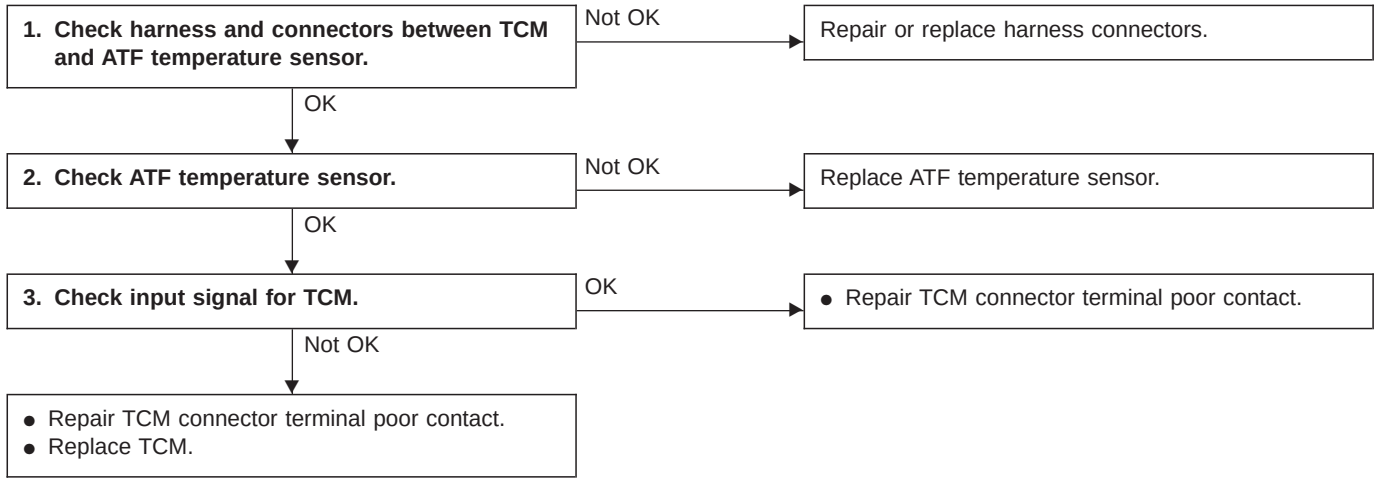
F: TROUBLE CODE 21
— ATF TEMPERATURE SENSOR —

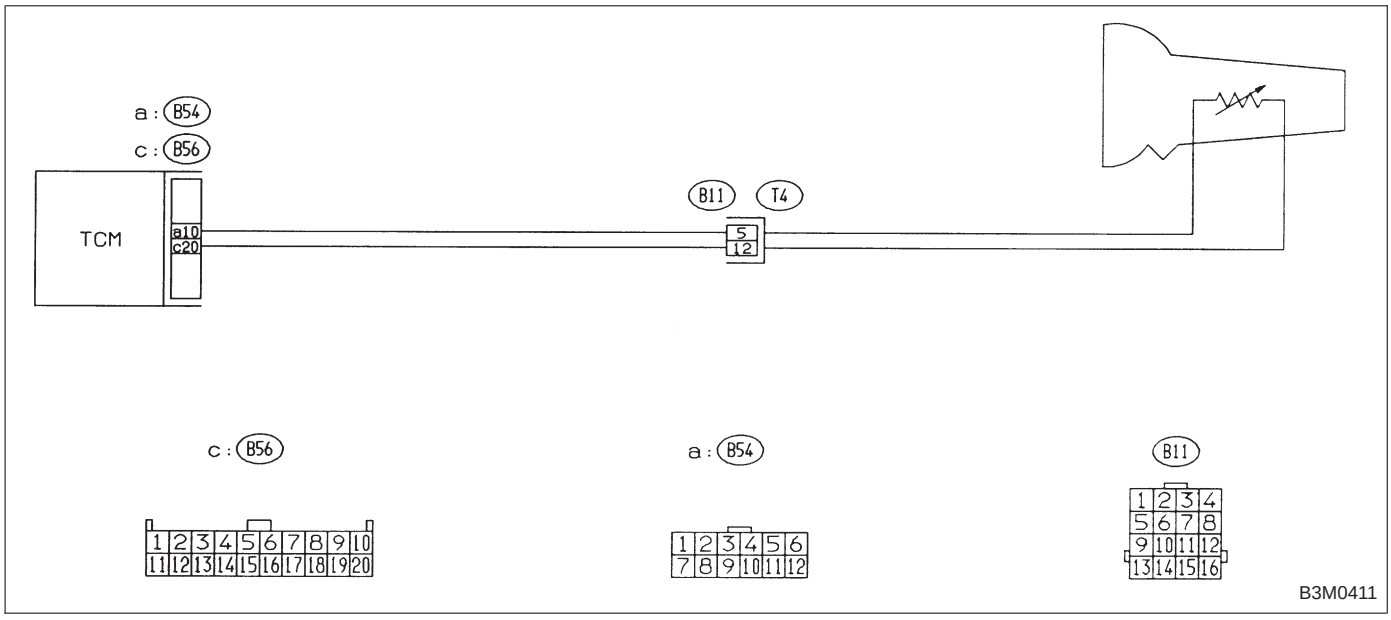
DIAGNOSIS:

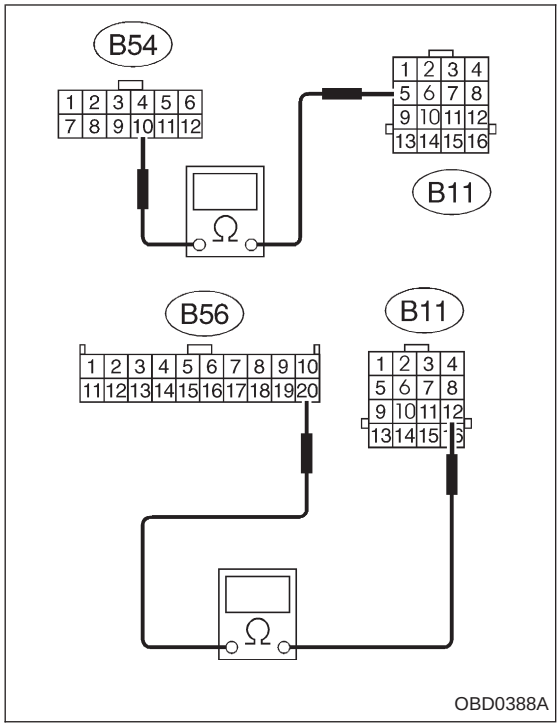
Input signal circuit of TCM to ATF temperature sensor is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock



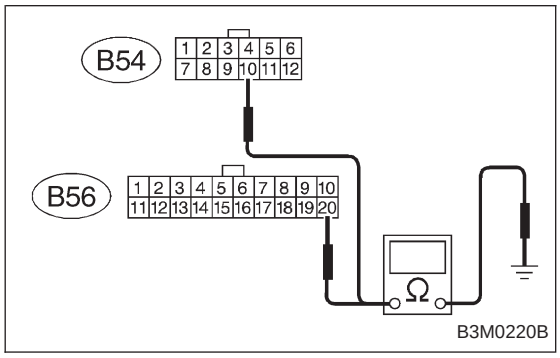




1. CHECK HARNESS AND CONNECTORS BETWEEN TCM AND ATF TEMPERATURE SENSOR.

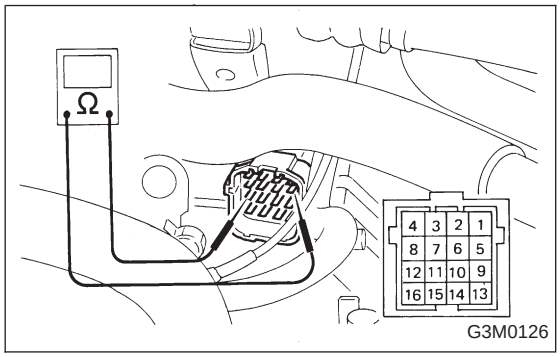
1) Turn ignition switch to OFF.
2) Disconnect connectors from TCM and transmission.
3) Measure resistance of harness connector between TCM and transmission connector.

Connector & terminal / Specified resistance:
(B54) No. 10 — (B11) No. 5 / 1 Ω, or less
(B56) No. 20 — (B11) No. 12 / 1 Ω, or less



4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

Connector & terminal / Specified resistance:
(B54) No. 10 — Body / 1 MΩ, or more
(B56) No. 20 — Body / 1 MΩ, or more



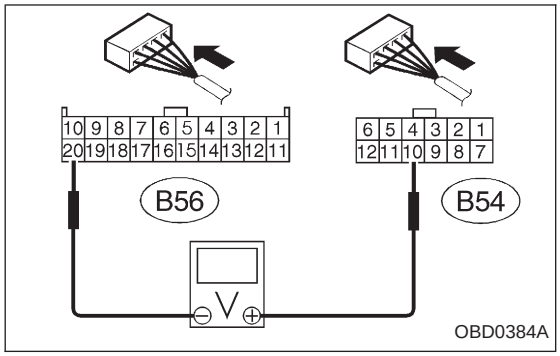
2. CHECK ATF TEMPERATURE SENSOR.

1) Measure resistance between transmission connector receptacle's terminals.

Connector & terminal / Specified resistance:
(T4) No. 5 — No. 12 /
2.1 — 2.9 kΩ [ATF temperature: 20°C (68°F)]

2) Connect connectors to transmission and TCM.
3) Start and warm-up the engine until ATF temperature has increased.
4) Stop the engine and disconnect connector from transmission.
5) Measure resistance between transmission connector receptacle's terminals.

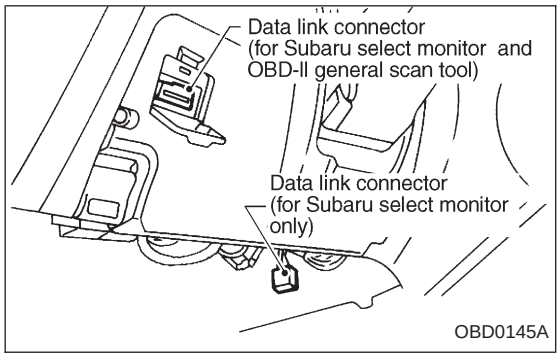
Connector & terminal / Specified resistance:
(T4) No. 5 — No. 12 /
275 — 375 Ω [ATF temperature: 80°C (176°F)]



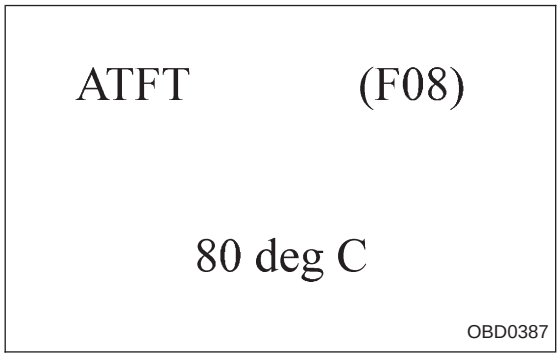
3. CHECK INPUT SIGNAL FOR TCM.

1) Turn ignition switch ON (with engine OFF) and measure signal voltage input of TCM.
2) Start and warm-up the engine. Measure signal voltage input of TCM.

Connector & terminal / Specified voltage:
(B54) No. 10 — (B56) No. 20 /
3.45±0.55 V [ATF temperature: 20°C (68°F)]
1.2±0.2 V [ATF temperature: 80°C (176°F)]



- Using Subaru select monitor:
  (1) Turn ignition switch to OFF.
  (2) Connect the Subaru select monitor to data link connector.
  (3) Turn ignition switch to ON and Subaru select monitor switch to ON.



  (4) Start and warm-up the engine.
  (5) Read data on Subaru select monitor.
  (6) Designate mode using function key.

Function mode: F07 or F08

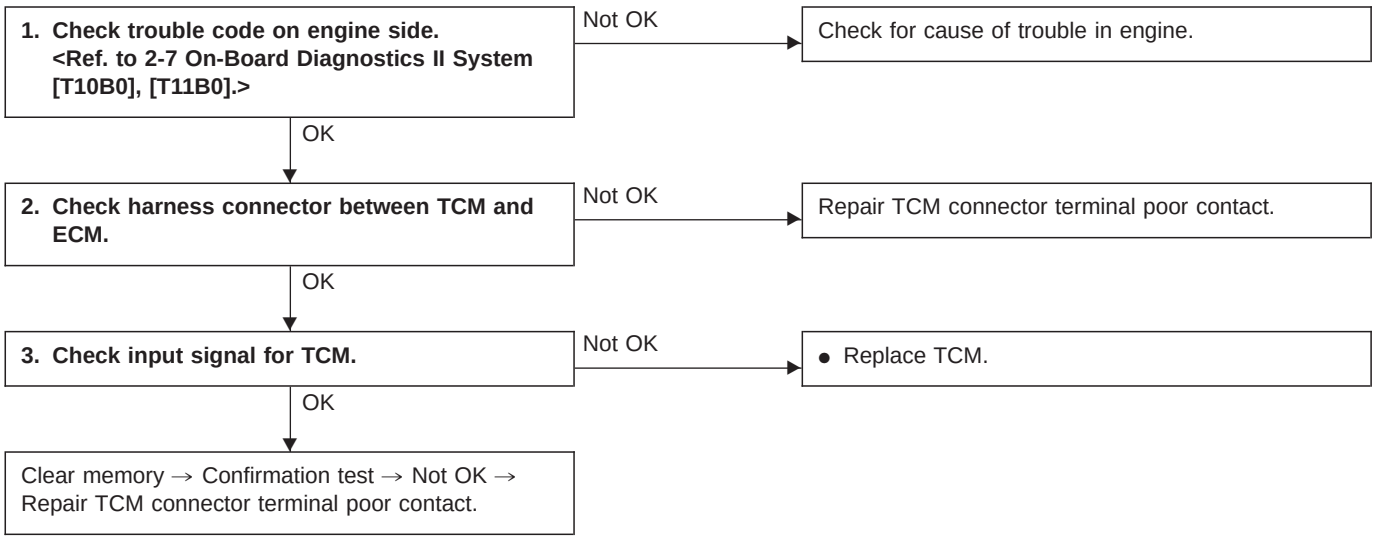
SPECIFIED DATA:
F07: ● ***Ambient temperature: ±50 deg F***
● ***ATF temperature: 158 — 230 deg F***
● ***Open harness: 176 deg F***
● ***Shorted harness: 320 deg F***
F08: ● ***Ambient temperature: ±10 deg C***
● ***ATF temperature: 70 — 110 deg C***
● ***Open harness: 80 deg C***
● ***Shorted harness: 160 deg C***

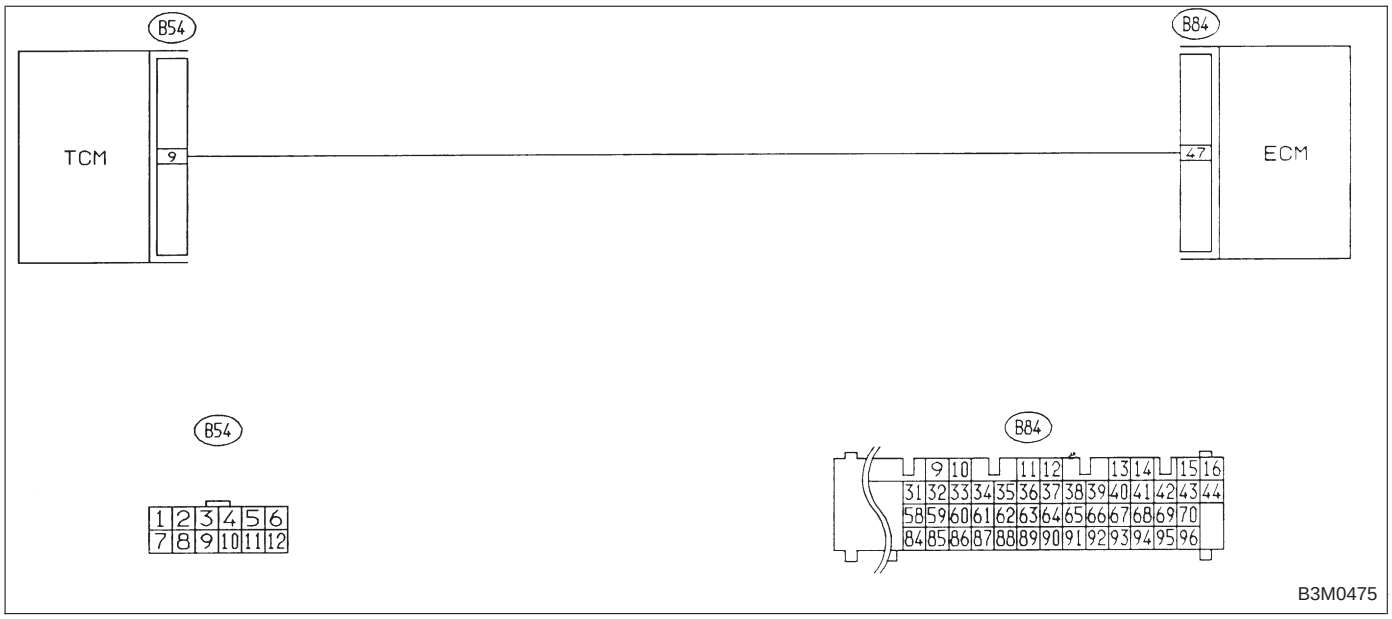
- F07: ATF temperature is indicated in “deg F”.
- F08: ATF temperature is indicated in “deg C”.

G: TROUBLE CODE 22
— MASS AIR FLOW SIGNAL —

DIAGNOSIS:

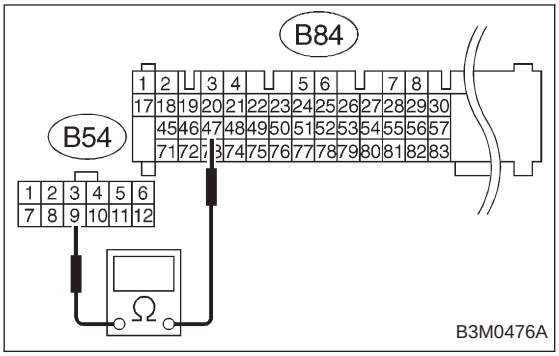
Input signal circuit of TCM from ECM is open or shorted.





1. CHECK TROUBLE CODE ON ENGINE SIDE.

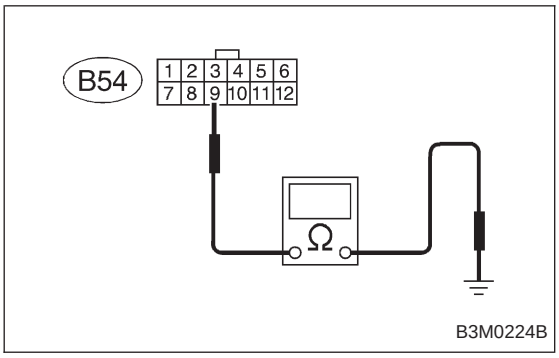
Using Subaru select monitor or OBD-general scan tool, check trouble code of mass air flow sensor on engine side.



2. CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.

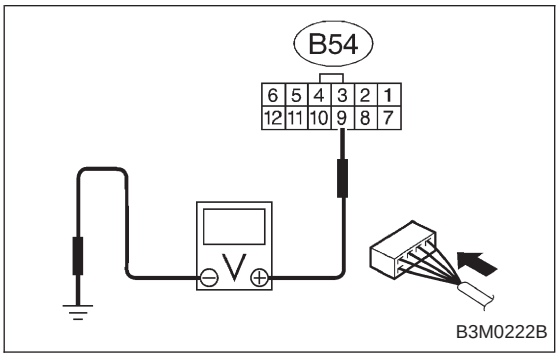
1) Turn ignition switch to OFF.
2) Disconnect connectors from TCM and ECM.
3) Measure resistance of harness connector between TCM and ECM.

Connector & terminal / Specified resistance:
(B54) No. 9 — (B84) No. 47 / 1 Ω, or less



4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

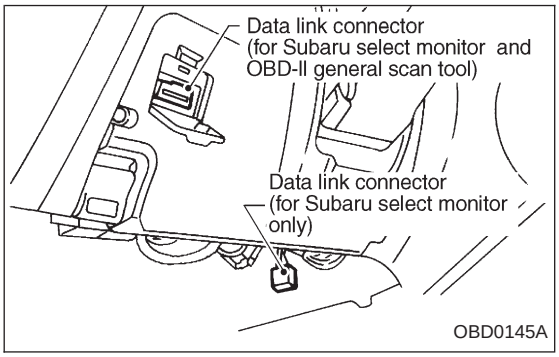
Connector & terminal / Specified resistance:
(B54) No. 9 — Body / 1 MΩ, or more



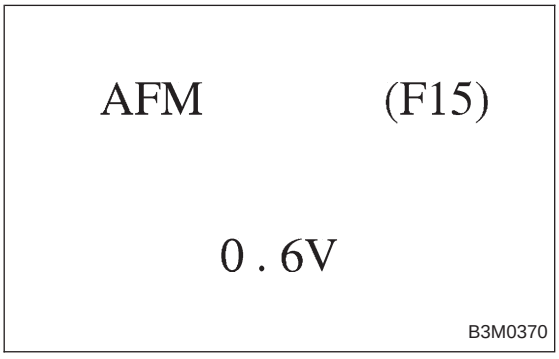
3. CHECK INPUT SIGNAL FOR TCM.

1) Connect connectors to TCM and ECM.
2) Start the engine. (engine idling after warm-up)
3) Measure signal voltage between TCM connector terminal and body.

Connector & terminal / Specified voltage:
Engine warm-up;
(B54) No. 9 — Body / 0.5 — 1.22 V



- Using Subaru select monitor:
  (1) Connect connectors to TCM and ECM.
  (2) Turn ignition switch to OFF.
  (3) Connect the Subaru select monitor to data link connector.
  (4) Turn ignition switch to ON and Subaru select monitor switch to ON.
  (5) Start and warm-up the engine.



(6) Read data on Subaru select monitor.
(7) Designate mode using function key.

Function mode: F15

SPECIFIED DATA:
0.5 — 1.22 V (Engine warm-up)

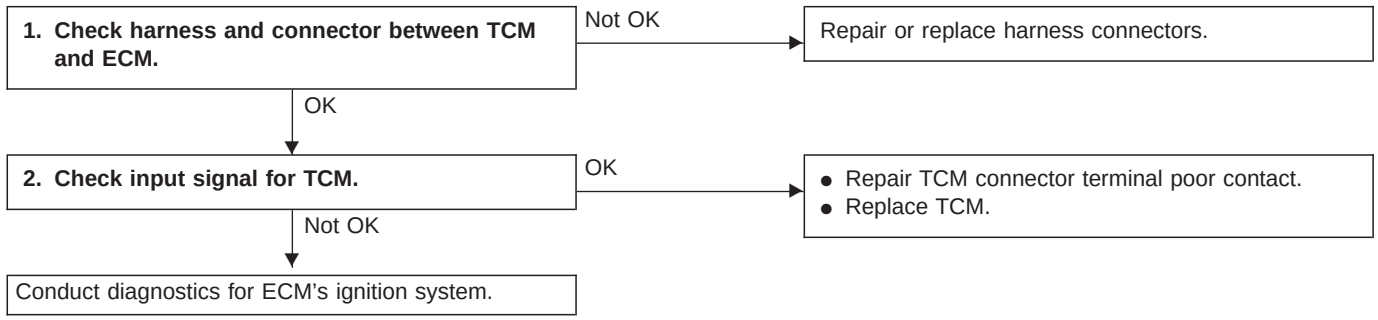
H: TROUBLE CODE 23 — ENGINE SPEED SIGNAL —

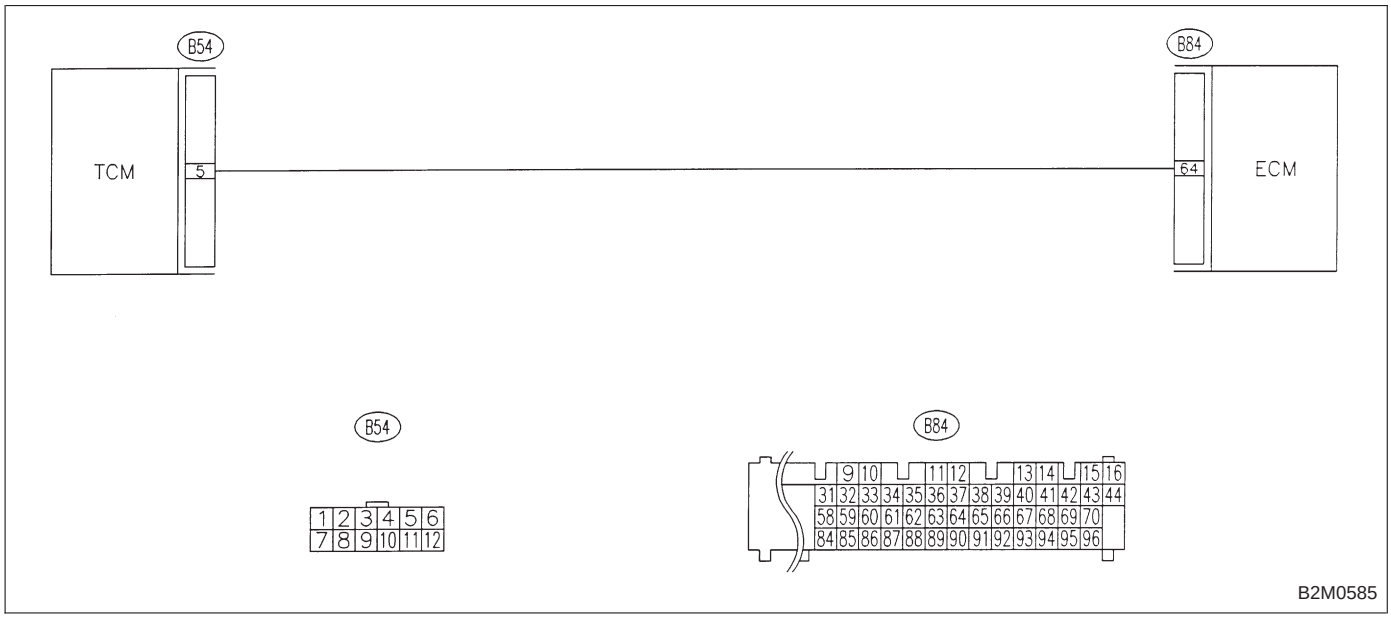
DIAGNOSIS:

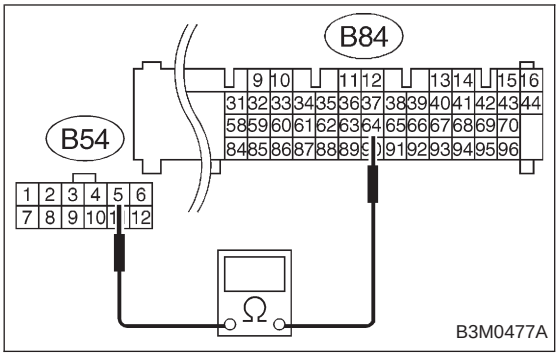
Engine speed input signal circuit is open or shorted.

TROUBLE SYMPTOM:

- No lock-up (after engine warm-up)
- AT OIL TEMP indicator remains on when vehicle speed is “0”.



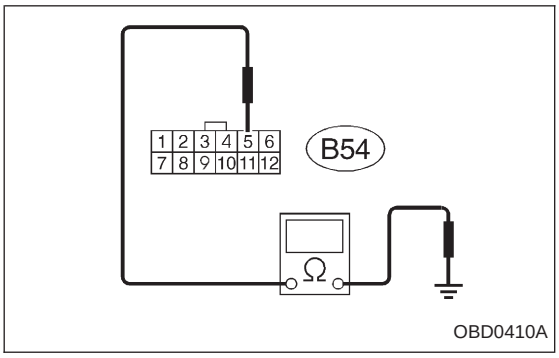




1. CHECK HARNESS AND CONNECTOR BETWEEN TCM AND ECM.

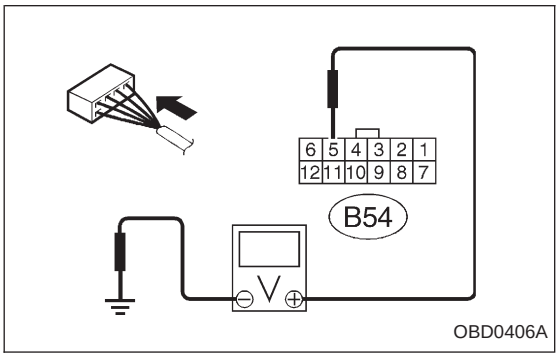
1) Turn ignition switch to OFF.
2) Disconnect connectors from TCM and ECM.
3) Measure resistance of harness connector between TCM and ECM.

Connector & terminal / Specified resistance:
(B54) No. 5 — (B84) No. 64 / 1 Ω, or less



4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

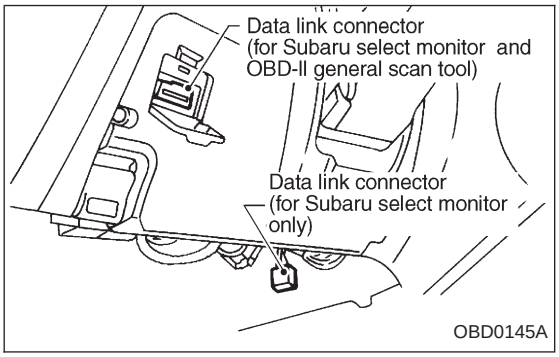
Connector & terminal / Specified resistance:
(B54) No. 5 — Body / 1 MΩ, or more



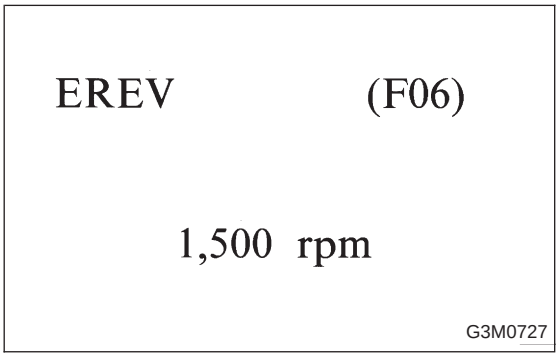
2. CHECK INPUT SIGNAL FOR TCM.

1) Connect connectors to ECM and TCM.
2) Turn ignition switch ON (with engine OFF).
3) Measure signal voltage for TCM.

Connector & terminal / Specified voltage:
(B54) No. 5 — Body / 10.5 V, or more



- Using Subaru select monitor:
  (1) Connect connectors to ECM and TCM.
  (2) Turn ignition switch to OFF.
  (3) Connect the Subaru select monitor to data link connector.
  (4) Turn ignition switch to ON and Subaru select monitor switch to ON.



(5) Start and warm-up the engine.
(6) Operate at constant engine speed.
(7) Read data on Subaru select monitor.
(8) Designate mode using function key.

Function mode: F06

SPECIFIED DATA:
Same as tachometer reading (in combination meter)

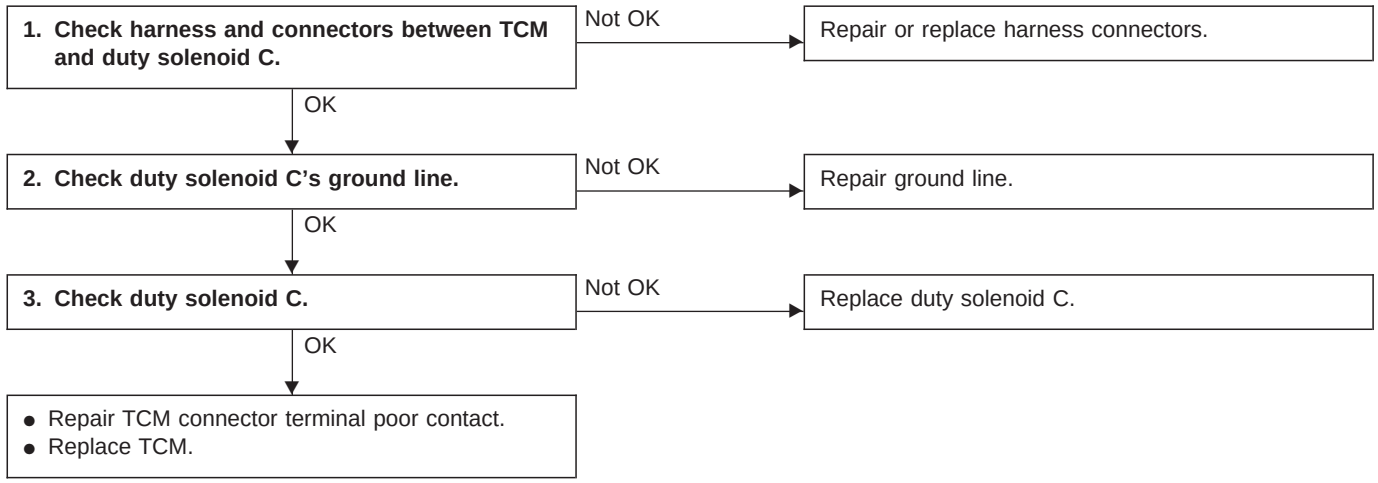
I: TROUBLE CODE 24 — DUTY SOLENOID C —

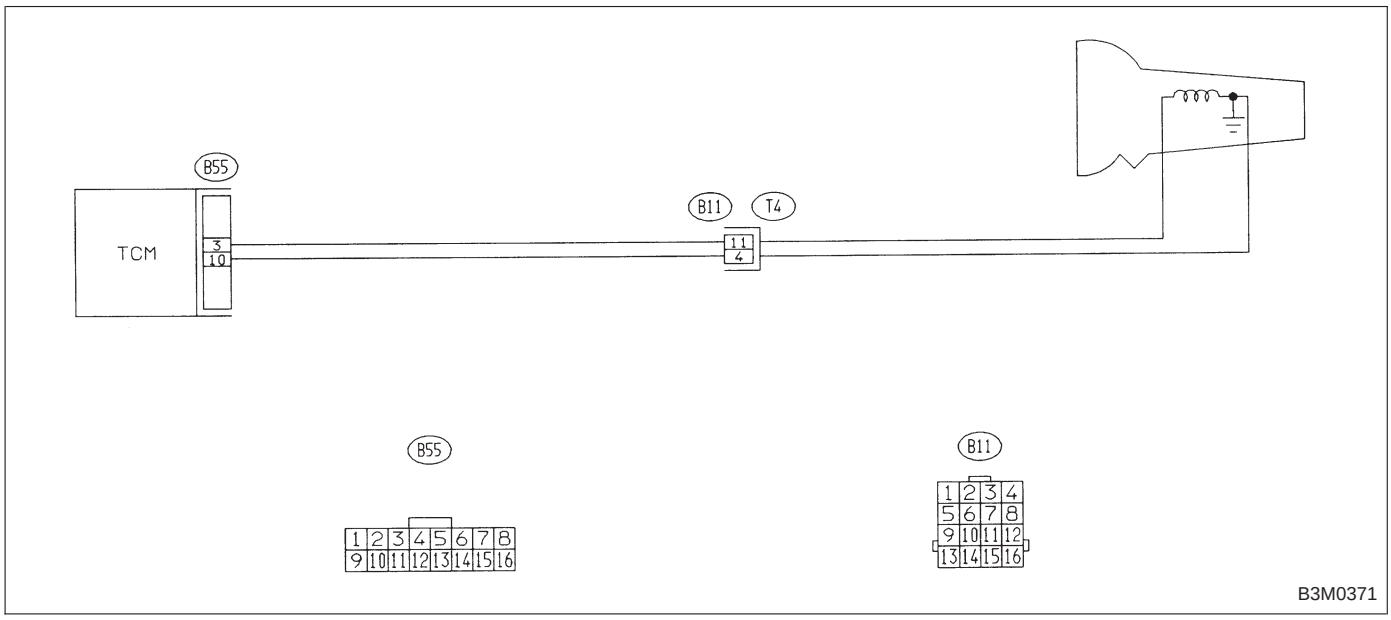
DIAGNOSIS:

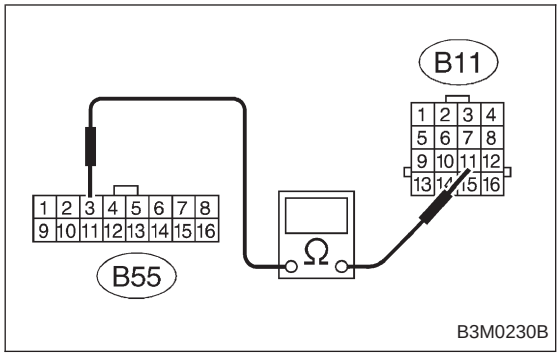
Output signal circuit of duty solenoid C is open or shorted.

TROUBLE SYMPTOM:

Excessive “braking” in tight corners



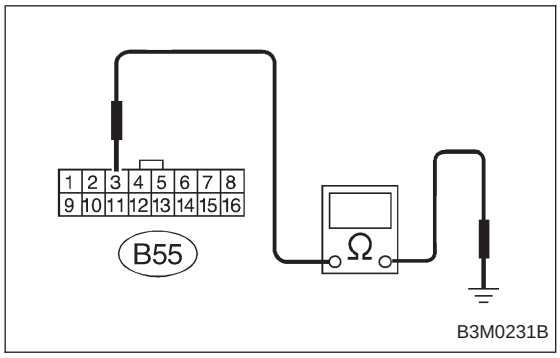




1. CHECK HARNESS AND CONNECTORS BETWEEN TCM AND DUTY SOLENOID C.

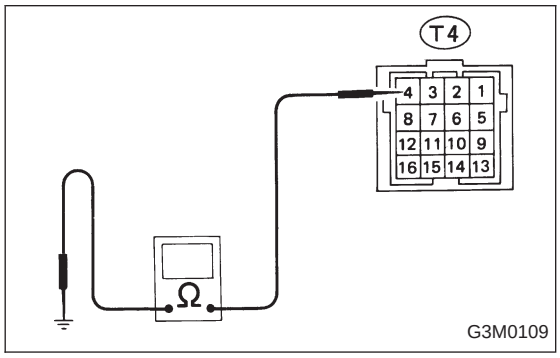
1) Turn ignition switch to OFF.
2) Disconnect connectors from TCM and transmission.
3) Measure resistance of harness connector between TCM and transmission.

Connector & terminal / Specified resistance:
(B55) No. 3 — (B11) No. 11 / 1 Ω, or less



4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

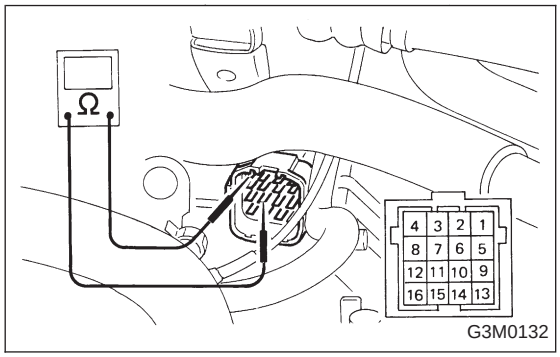
Connector & terminal / Specified resistance:
(B55) No. 3 — Body / 1 MΩ, or more



2. CHECK DUTY SOLENOID C's GROUND LINE.

Measure resistance between transmission connector receptacle and transmission case.

Connector & terminal / Specified resistance:
(T4) No. 4 — Transmission / 1 Ω, or less



3. CHECK DUTY SOLENOID C.

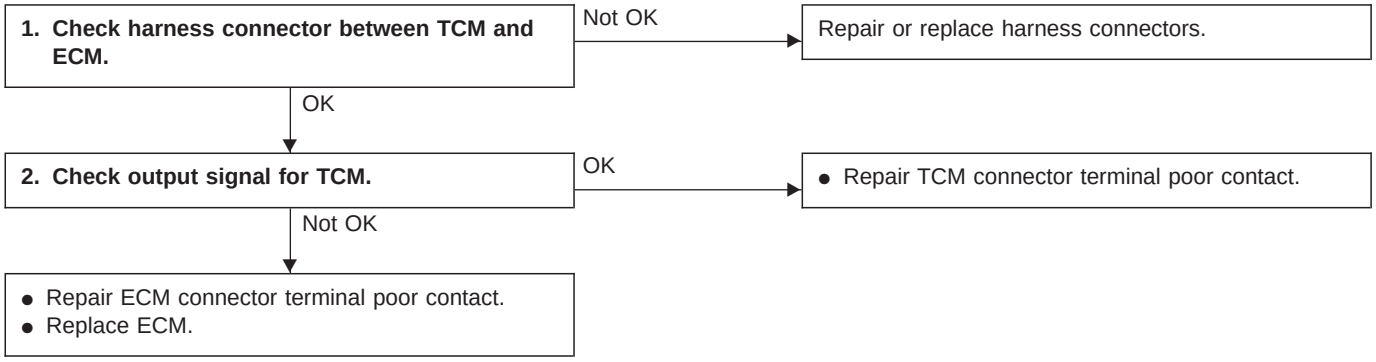
Measure resistance between transmission connector receptacle's terminals.

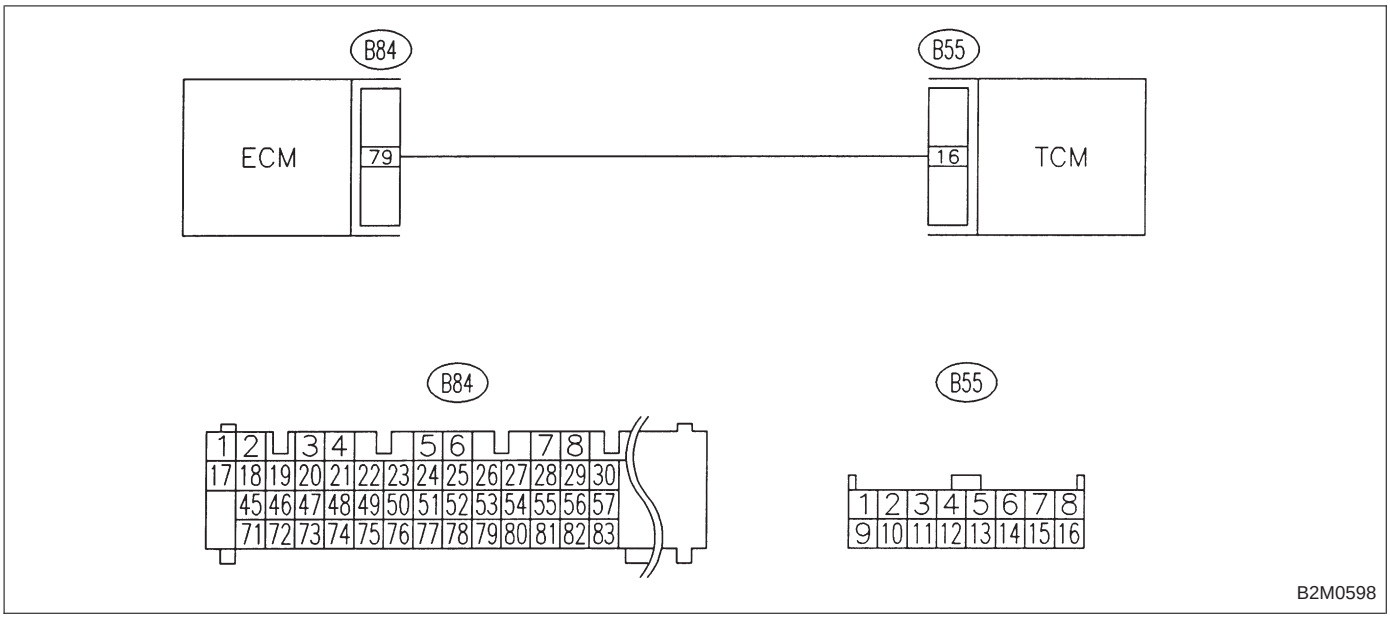
Connector & terminal / Specified resistance:
(T4) No. 11 — No. 4 / 9 — 17 Ω

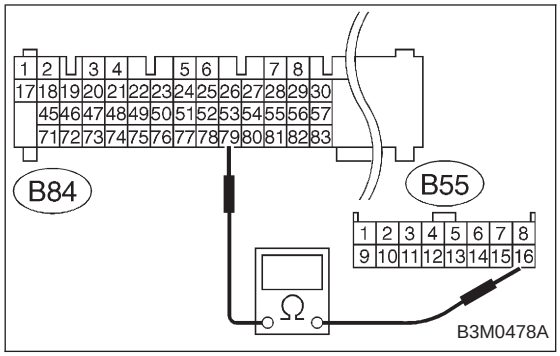
J: TROUBLE CODE 25
— TORQUE CONTROL SIGNAL —

DIAGNOSIS:

- Torque control signal is not emitted from TCM.
- The signal circuit is open or shorted.



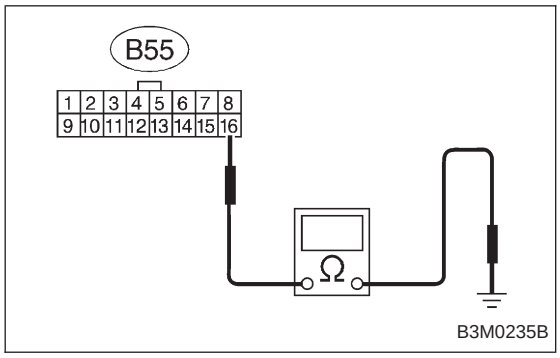




1. CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.

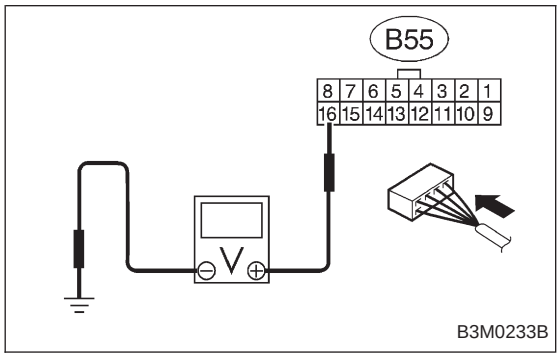
1) Turn ignition switch to OFF.
2) Disconnect connectors from TCM and ECM.
3) Measure resistance of harness connector between TCM and ECM.

Connector & terminal / Specified resistance:
(B55) No. 16 — (B84) No. 79 / 1 Ω, or less



4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

Connector & terminal / Specified resistance:
(B55) No. 16 — Body / 1 MΩ, or more



2. CHECK OUTPUT SIGNAL FOR TCM.

1) Connect connectors to TCM and ECM.
2) Turn ignition switch to ON.
3) Measure signal voltage between TCM connector terminal and body.

Connector & terminal / Specified voltage:
(B55) No. 16 — Body / 5±1 V

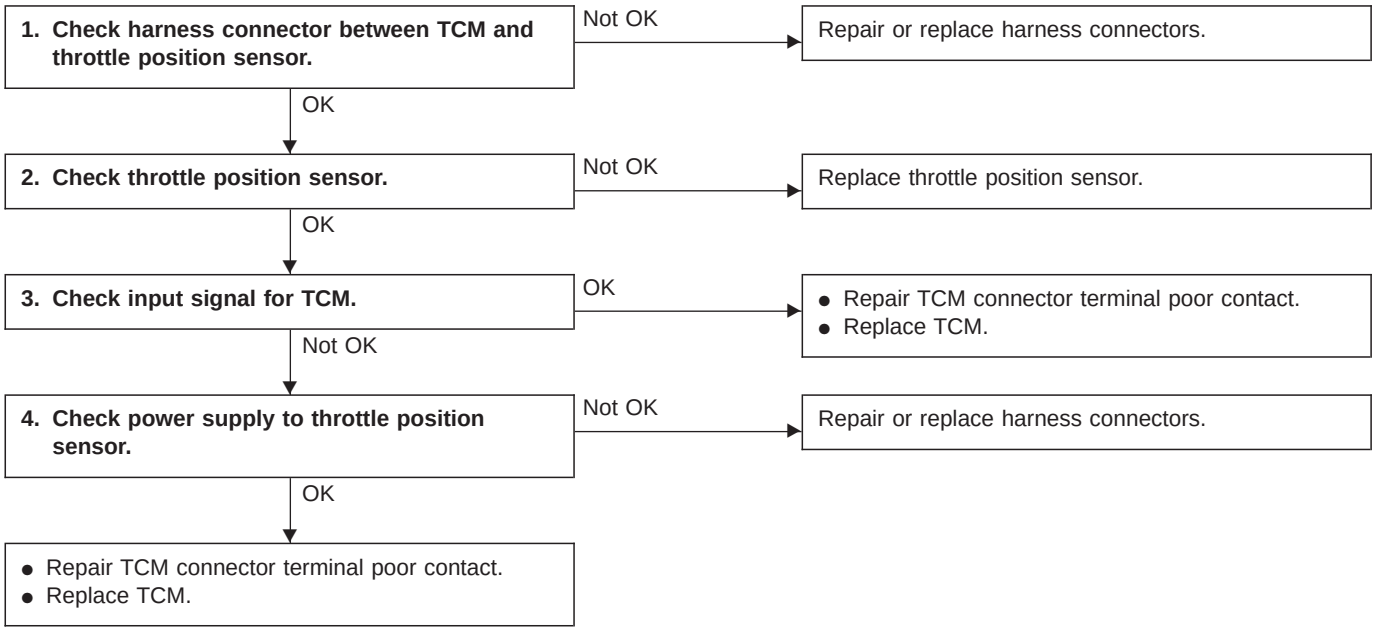
K: TROUBLE CODE 31 — THROTTLE POSITION SENSOR —

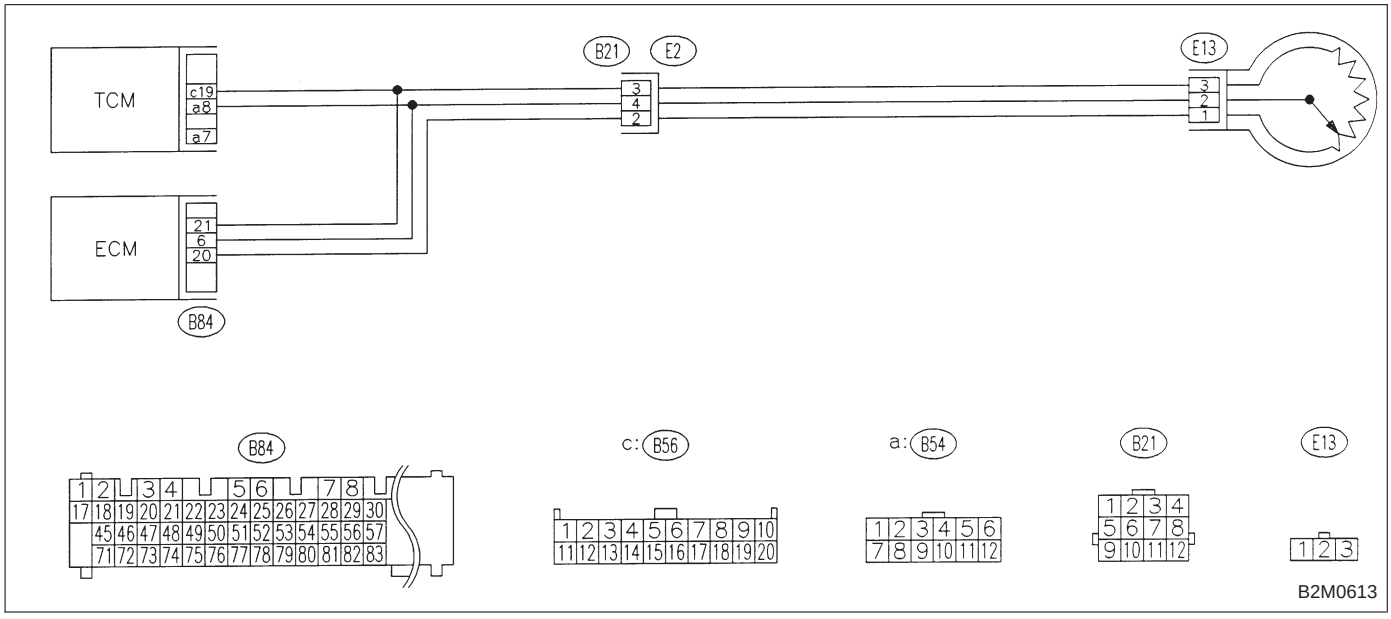
DIAGNOSIS:

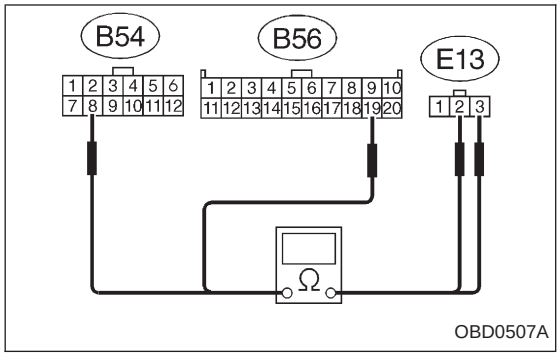
Input signal circuit of throttle position sensor is open or shorted.

TROUBLE SYMPTOM:

Shift point too high or too low; engine brake not effected in “3” range; excessive shift shock; excessive tight corner “braking”



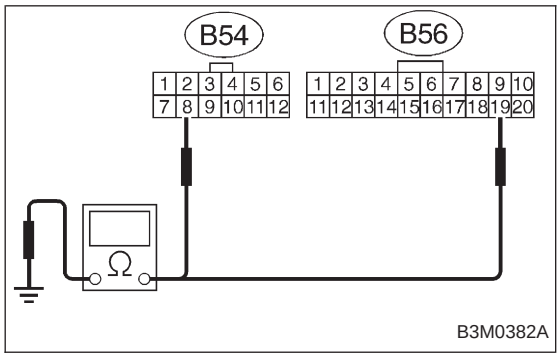




1. CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR.

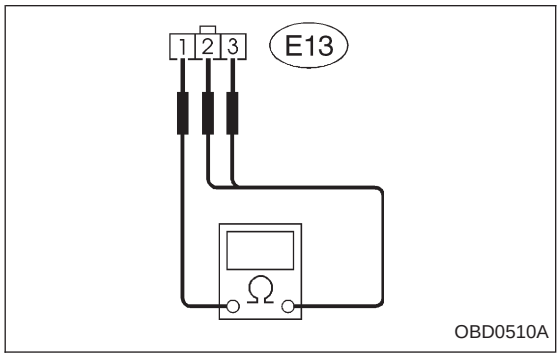
1) Turn ignition switch to OFF.
2) Disconnect connector from TCM and throttle position sensor.
3) Measure resistance of harness connector between TCM and throttle position sensor.

Connector & terminal / Specified resistance:
(B54) No. 8 — (E13) No. 2 / 1 Ω, or less
(B56) No. 19 — (E13) No. 3 / 1 Ω, or less



4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

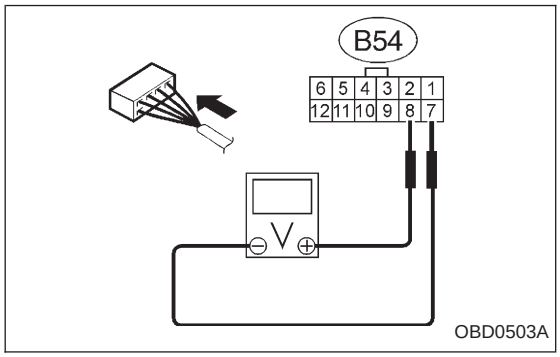
Connector & terminal / Specified resistance:
(B54) No. 8 — Body / 1 MΩ, or more
(B56) No. 19 — Body / 1 MΩ, or more



2. CHECK THROTTLE POSITION SENSOR.

Measure resistance between throttle position sensor terminals.

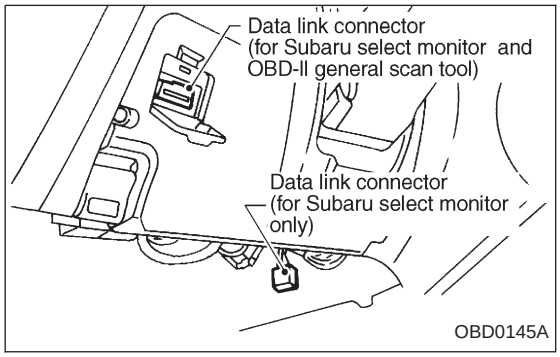
Terminals / Specified resistance:
(E13) No. 1 — No. 2 / 0.3 — 0.7 kΩ
(Throttle fully closed.)
3 — 6 kΩ
(Throttle fully open.)
(E13) No. 1 — No. 3 / 3.5 — 6.5 kΩ



3. CHECK INPUT SIGNAL FOR TCM.

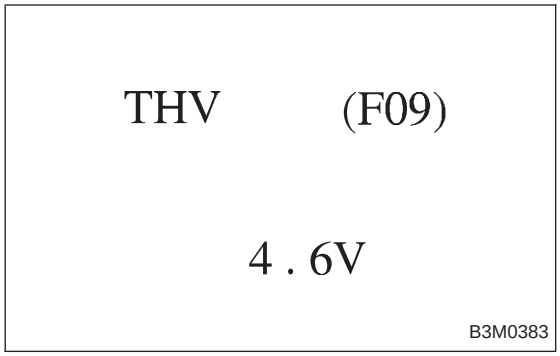
1) Connect connectors to TCM and throttle position sensor.
2) Turn ignition switch ON (with engine OFF).
3) Measure signal voltage input emitted from throttle position sensor with accelerator pedal fully depressed.

Connector & terminal / Specified voltage:
(B54) No. 8 — No. 7 /
0.5±0.2 V (Throttle fully closed.)
4.6±0.3 V (Throttle fully open.)



- Using Subaru select monitor:

(1) Connect connectors to TCM and throttle position sensor.
(2) Turn ignition switch to OFF.
(3) Connect the Subaru select monitor to data link connector.
(4) Turn ignition switch to ON and Subaru select monitor switch to ON.

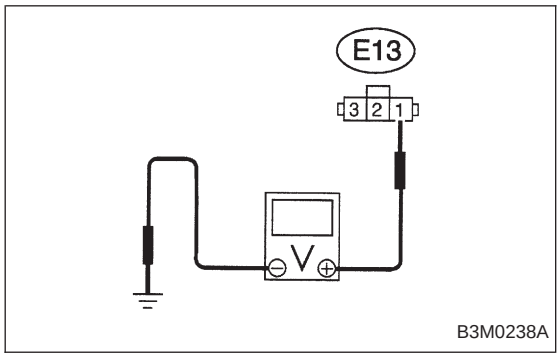


(5) Designate mode using function key.
(6) Read data on Subaru select monitor.

Function mode: F09

SPECIFIED DATA:

0.5±0.2 V (Throttle fully closed.)
4.6±0.3 V (Throttle fully open.)
[Must be changed correspondingly with accelerator pedal operation (from "released" to "depressed" position).]

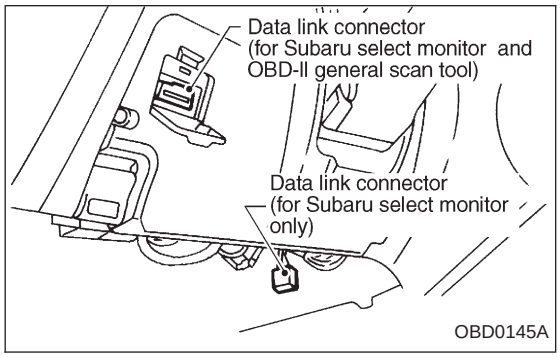


4. CHECK POWER SUPPLY TO THROTTLE POSITION SENSOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from throttle position sensor.
3) Turn ignition switch to ON.
4) Measure power supply voltage to throttle position sensor.

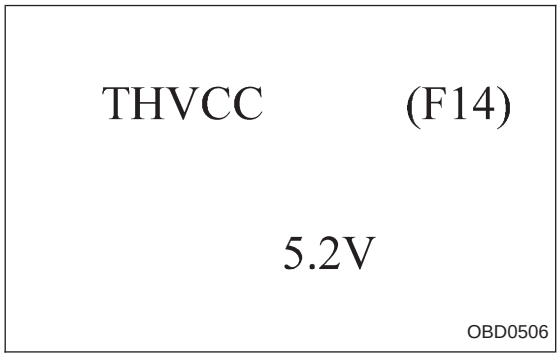
Connector & terminal / Specified voltage:

(E13) No. 1 — Body / 5.12±0.1 V



- Using Subaru select monitor:

(1) Turn ignition switch to OFF.
(2) Connect the Subaru select monitor to data link connector.
(3) Turn ignition switch to ON and Subaru select monitor switch to ON.



(4) Designate mode using function key.
(5) Read data on Subaru select monitor.

Function mode: F14

SPECIFIED DATA:

5.12±0.1 V

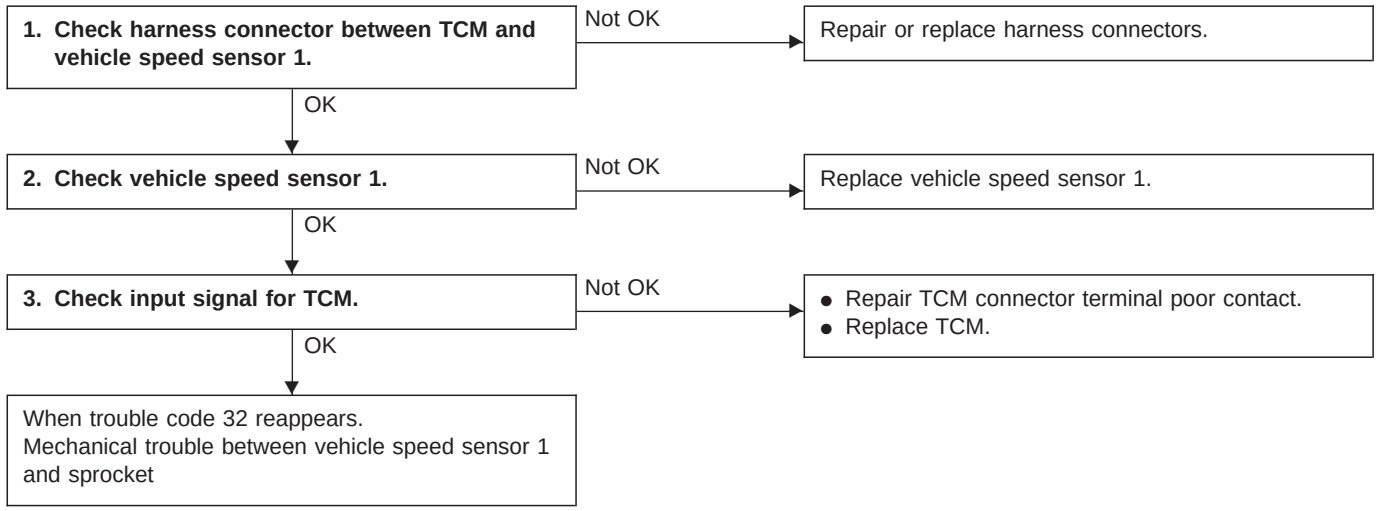
L: TROUBLE CODE 32 — VEHICLE SPEED SENSOR 1 —

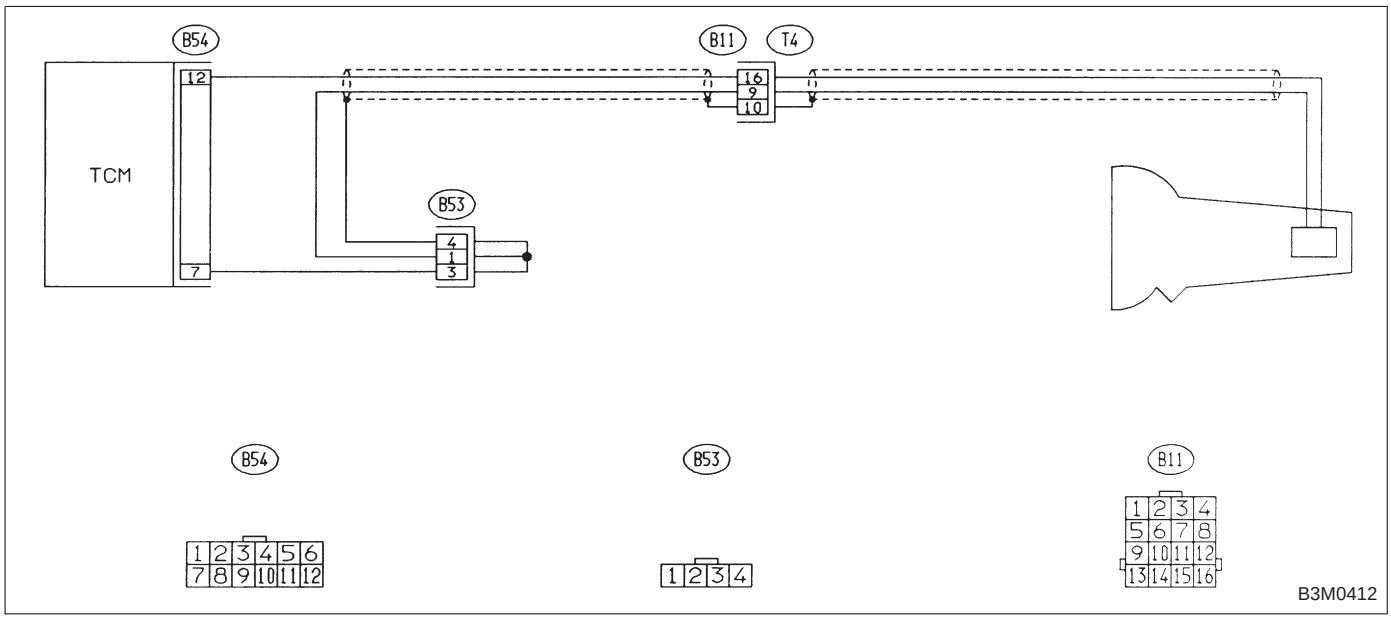
DIAGNOSIS:

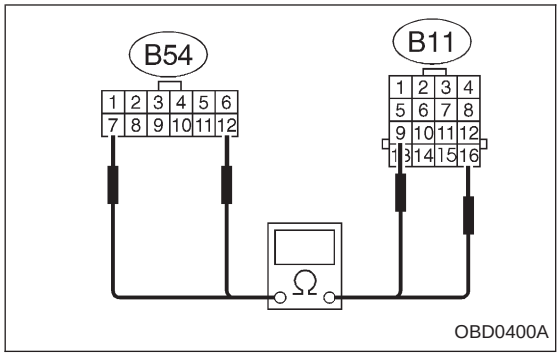
Input signal circuit of TCM is open or shorted.

TROUBLE SYMPTOM:

No locking-up or excessive tight corner “braking”



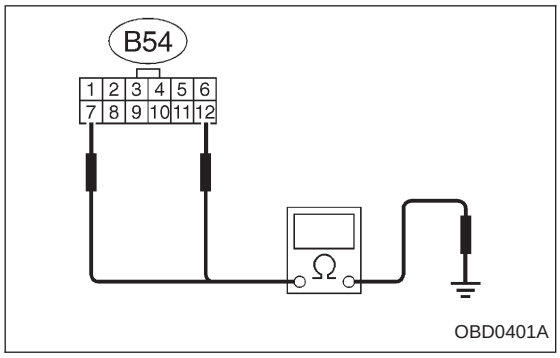




1. CHECK HARNESS CONNECTOR BETWEEN TCM AND VEHICLE SPEED SENSOR 1.

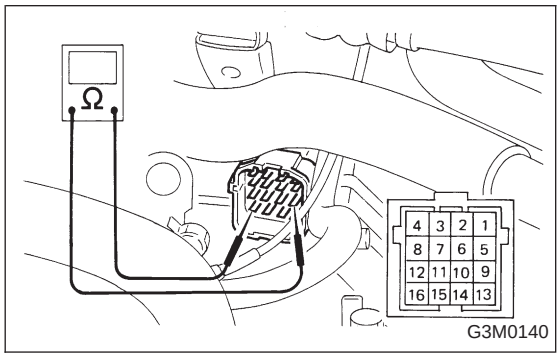
1) Turn ignition switch to OFF.
2) Disconnect connectors from TCM and transmission.
3) Measure resistance of harness connector between TCM and transmission connector.

Connector & terminal / Specified resistance:
(B54) No. 12 — (B11) No. 16 / 1 Ω, or less
(B54) No. 7 — (B11) No. 9 / 1 Ω, or less



4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

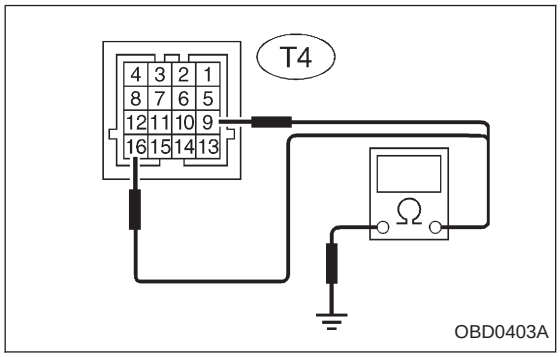
Connector & terminal / Specified resistance:
(B54) No. 7 — Body / 1 MΩ, or more
(B54) No. 12 — Body / 1 MΩ, or more



2. CHECK VEHICLE SPEED SENSOR 1.

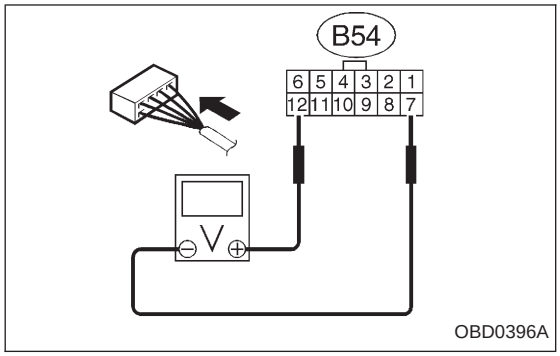
1) Measure resistance between transmission connector receptacle's terminals.

Connector & terminal / Specified resistance:
(T4) No. 16 — No. 9 / 450 — 720 Ω



2) Measure resistance of harness connector between transmission connector and transmission case to make sure that circuit does not short.

Connector & terminal / Specified resistance:
(T4) No. 16 — Transmission / 1 MΩ, or more
(T4) No. 9 — Transmission / 1 MΩ, or more



3. CHECK INPUT SIGNAL FOR TCM.

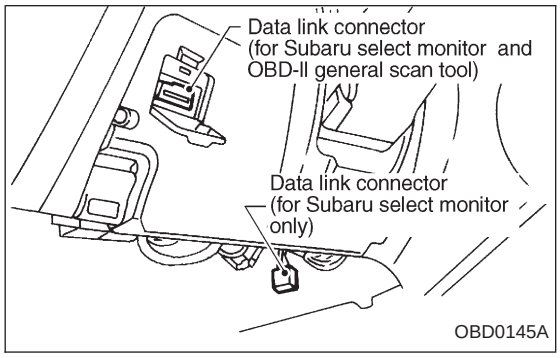
1) Connect connectors to TCM and transmission.
2) Lift-up or raise the vehicle and place safety stands.

CAUTION:
On AWD models, raise all wheels off floor.

3) Push the TCS OFF switch to ON. (With TCS models)
4) Start the engine and set vehicle in 20 km/h (12 MPH) condition.
5) Measure voltage between TCM connector terminals.

Connector & terminal / Specified voltage:
(B54) No. 12 — No. 7 / AC 1 V, or more

NOTE:
The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.
<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>



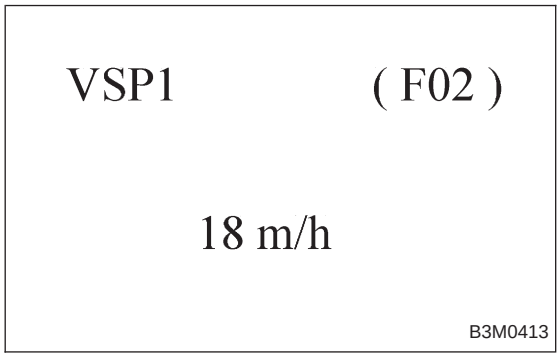
- Using Subaru select monitor:
  (1) Connect connectors to TCM and transmission.
  (2) Turn ignition switch to OFF.
  (3) Connect the Subaru select monitor to data link connector.
  (4) Lift-up or raise the vehicle and place safety stands.

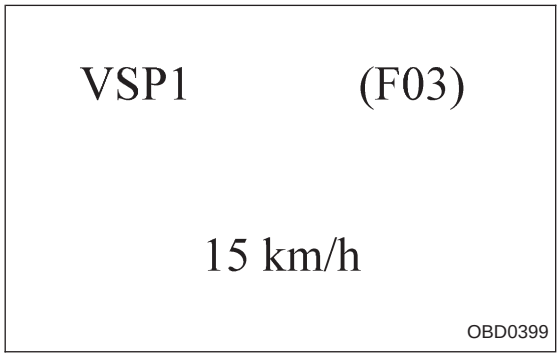
CAUTION:
On AWD models, raise all wheels off floor.

  (5) Turn ignition switch to ON and Subaru select monitor switch to ON.
  (6) Push the TCS OFF switch to ON. (With TCS models)
  (7) Start the engine and operate at constant speed.
  (8) Read data on Subaru select monitor.
  (9) Designate mode using function key.

Function mode: F02 or F03

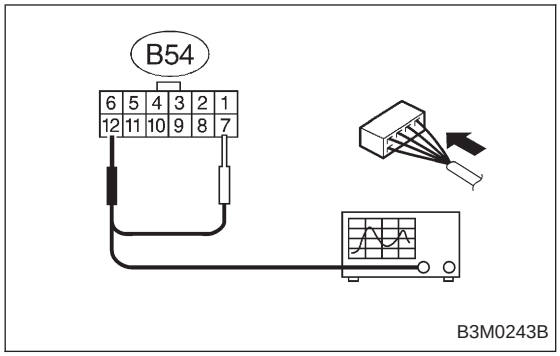
SPECIFIED DATA:
F02: Compare speedometer with monitor indications.
F03: Compare speedometer with monitor indications.





- F02: Vehicle speed is indicated in “m/h”.
- F03: Vehicle speed is indicated in “km/h”.

NOTE:
The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.
<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>



- Using oscilloscope:
  (1) Connect connectors to TCM and transmission.
  (2) Lift-up the vehicle and place safety stands.

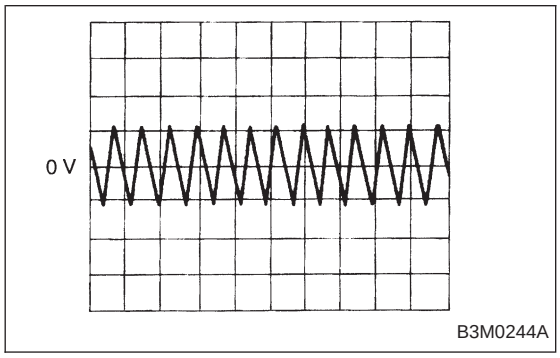
WARNING:

On AWD models, make sure that all wheels are raised off floor.

(3) Set oscilloscope to TCM connector terminals.

Connector & terminals:

Positive probe; (B54) No. 12
Earth lead; (B54) No. 7



(4) Push the TCS OFF switch to ON. (With TCS models)
(5) Start the engine, and set vehicle in 20 km/h (12 MPH) condition.
(6) Measure signal voltage indicated on oscilloscope.

Specified voltage: AC 1 V, or more

NOTE:
The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.
<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>

M: TROUBLE CODE 33 — VEHICLE SPEED SENSOR 2 —

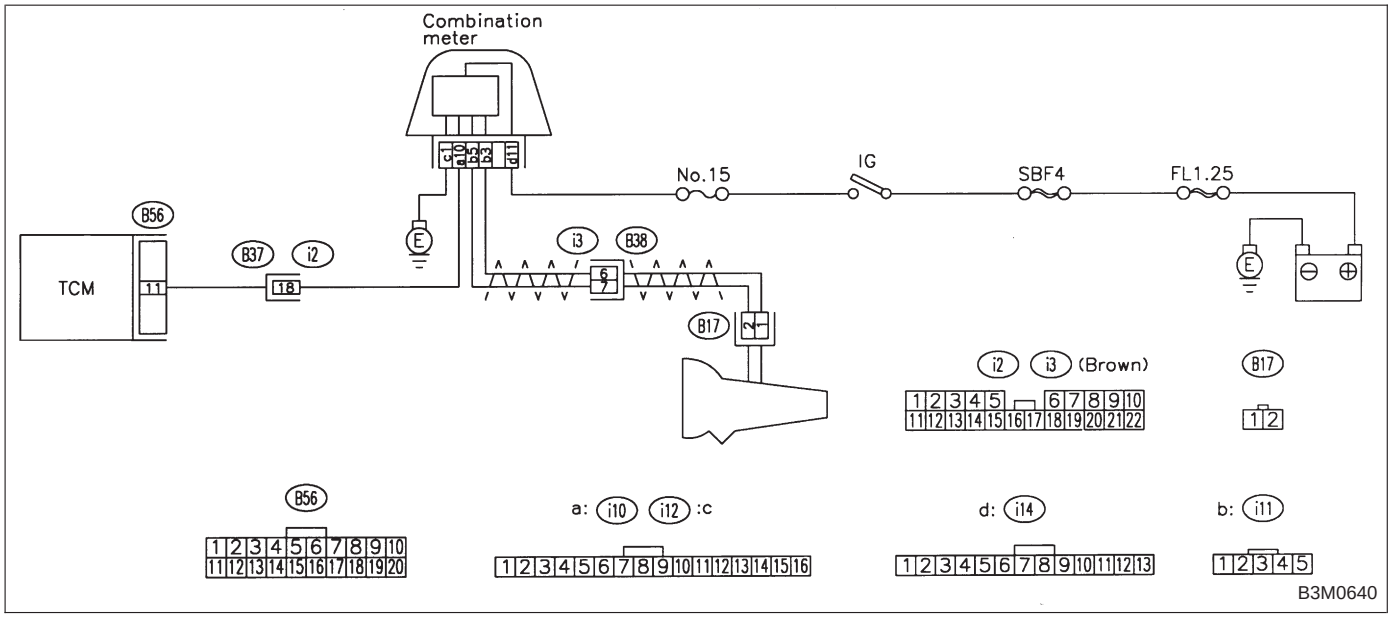
DIAGNOSIS:

- The vehicle speed signal is abnormal.
- The circuit in combination meter is faulty.
- The harness connector between TCM and vehicle speed sensor is in short or open.

TROUBLE SYMPTOM:

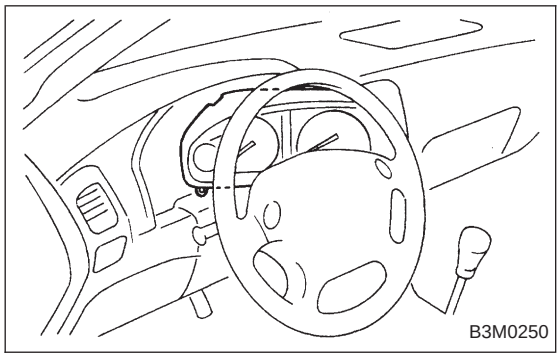
- Erroneous idling
- Engine stalls.
- Poor driving performance

1. Check operation of speedometer.	Not OK	Check combination meter circuit. <Ref. to 6-2 [K3A0].>
OK ↓		
2. Check harness connector between TCM and combination meter.	Not OK	Repair or replace harness connector.
OK ↓		
3. Check vehicle speed sensor 2.	Not OK	• Mechanical trouble between vehicle speed sensor 2 and speedometer shaft in transmission • Failure of the vehicle speed sensor 2 → Replace vehicle speed sensor 2.
OK ↓		
4. Check input signal for TCM.	Not OK	• Repair TCM connector terminal poor contact. • Replace TCM.
OK ↓		
When trouble code 33 reappears after clearing memory, repair TCM connector terminal poor contact.		



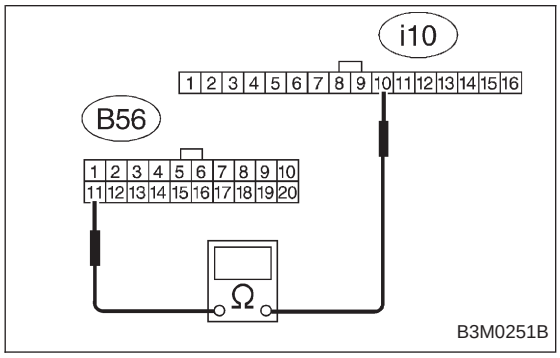
1. CHECK OPERATION OF SPEEDOMETER.

Make sure that speedometer indicates the vehicle speed by driving the vehicle.



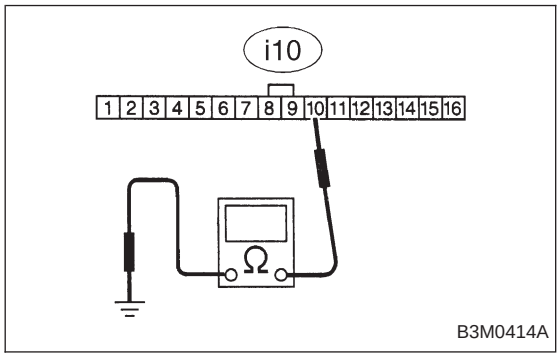
2. CHECK HARNESS CONNECTOR BETWEEN TCM AND COMBINATION METER.

1) Turn ignition switch to OFF.
2) Remove combination meter.



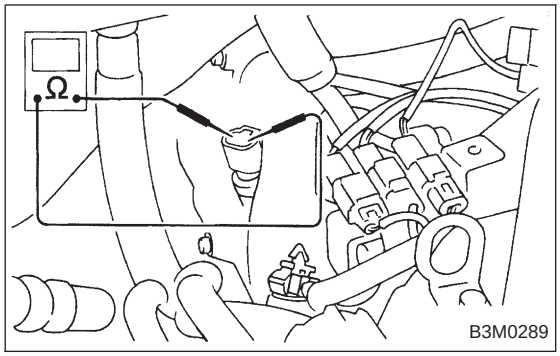
3) Disconnect connectors from TCM.
4) Measure resistance of harness connector between TCM and combination meter.

Connector & terminal / Specified resistance:
(B56) No. 11 — (i10) No. 10 / 1 Ω, or less



5) Measure resistance of harness connector between combination meter and body to make sure that circuit does not short.

Connector & terminal / Specified resistance:
(i10) No. 10 — Body / 1 MΩ, or more



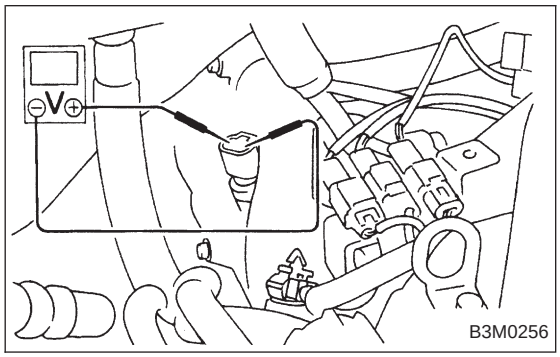
3. CHECK VEHICLE SPEED SENSOR 2.

1) Install combination meter.
2) Connect connector to TCM.
3) Lift-up the vehicle and place safety stand.

CAUTION:
On AWD models, raise all wheels off floor.

4) Disconnect connector from vehicle speed sensor 2.
5) Measure resistance between terminals of vehicle speed sensor 2.

Terminals / Specified resistance:
(B17) No. 1 — No. 2 / 350 — 450 Ω
No. 1 — Body / 1 MΩ, or more
No. 2 — Body / 1 MΩ, or more



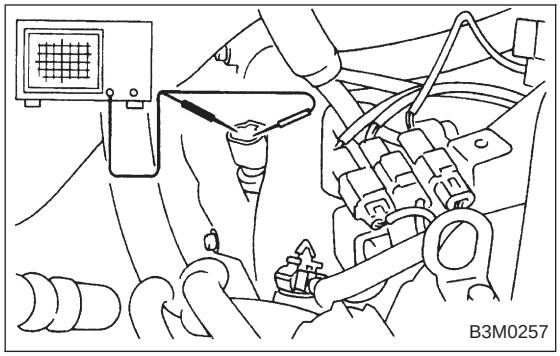
6) Push the TCS OFF switch to ON. (With TCS models)
7) Start the engine and set vehicle in 20 km/h (12 MPH) condition.
8) Measure output signal of vehicle speed sensor 2.

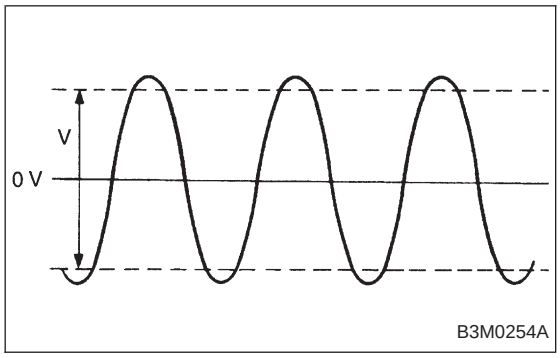
WARNING:
Be careful not to be caught up by the running wheels.

9) Using a voltage meter; measure voltage between terminals of vehicle speed sensor 2.

Terminals / Specified voltage:
(B17) No. 1 — No. 2 / AC 2 V, or more

NOTE:
The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.
<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>


B3M0257



B3M0254A

- Using oscilloscope:
  (1) Install combination meter.
  (2) Connect connector to TCM.
  (3) Lift-up the vehicle and place safety stand.

WARNING:
On AWD models, make sure that all wheels are raised off floor.

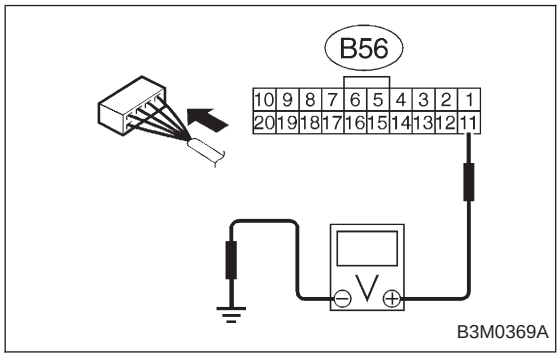
(4) Set oscilloscope to vehicle speed sensor 2.

Connector & terminal / No. 1 — No. 2

(5) Push the TCS OFF switch to ON. (With TCS models)
(6) Start the engine, and drive the wheels slowly.
(7) Measure signal voltage indicated on oscilloscope.

Specified voltage: AC 2 V, or more

NOTE:
The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.
<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>



B3M0369A

4. CHECK INPUT SIGNAL FOR TCM.

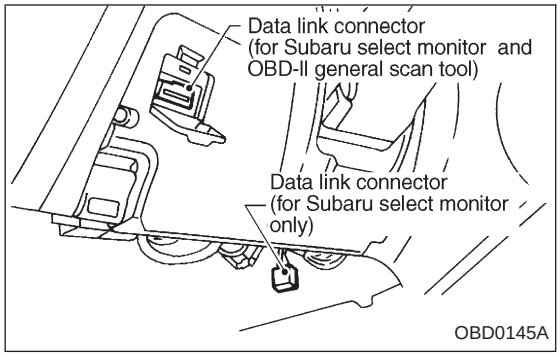
1) Connect connector to vehicle speed sensor 2.
2) Lift-up the vehicle or set the vehicle on free roller.

CAUTION:
On AWD models, raise all wheels off floor.

3) Push the TCS OFF switch to ON. (With TCS models)
4) Start the engine, and drive the wheels slowly.
5) Measure voltage between TCM and body.

Connector & terminal / Specified voltage:
(B56) No. 11 — Body / Less than 1 ↔ more than 9 V

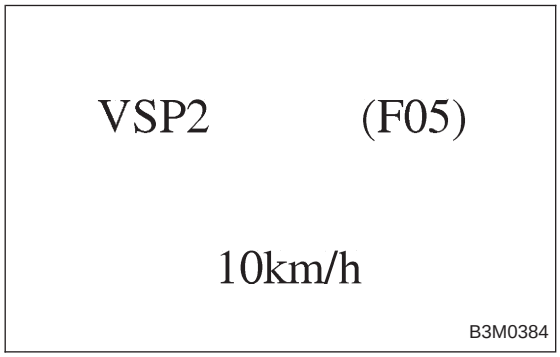
NOTE:
The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.
<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>



- Using Subaru select monitor:
  (1) Install combination meter.
  (2) Connect connectors to TCM and vehicle speed sensor 2.
  (3) Lift-up the vehicle or set the vehicle on free roller.
  (4) Turn ignition switch to OFF.
  (5) Connect the Subaru select monitor to data link connector.
  (6) Turn ignition switch to ON and Subaru select monitor switch to ON.

CAUTION:
On AWD models, raise all wheels off floor.

(7) Push the TCS OFF switch to ON. (With TCS models)



(8) Start the engine, and drive the wheels.
(9) Read data on Subaru select monitor.
(10) Designate mode using function key.

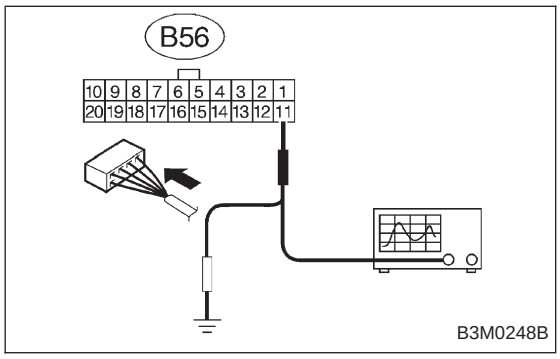
Function mode: F04 or F05

SPECIFIED DATA:

Compare speedometer with select monitor indications.

- F04: Vehicle speed is indicated in mile per hour (MPH).
- F05: Vehicle speed is indicated in kilometer per hour (km/h).

NOTE:
The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.
<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>



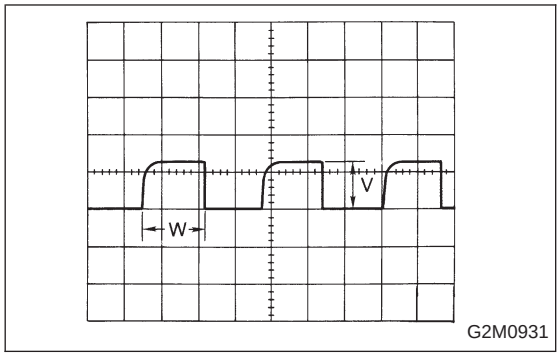
- Using oscilloscope:
  (1) Connect connector to vehicle speed sensor 2.
  (2) Lift-up the vehicle or set the vehicle on free rollers.

CAUTION:
On AWD models, raise all wheels off floor.

(3) Set oscilloscope to TCM connector terminals.

Connector & terminals:

Positive probe; (B56) No. 11
Earth lead; Body



(4) Push the TCS OFF switch to ON. (with TCS models)
(5) Start the engine.
(6) Shift on the gear position, and keep the vehicle speed at constant.
(7) Measure signal voltage.

Specified voltage: 2 V, or more

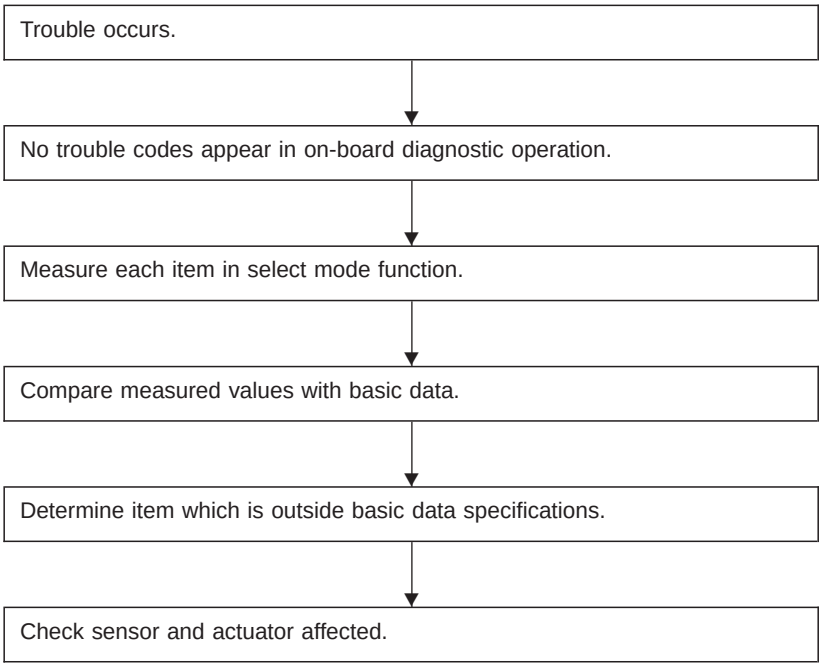
NOTE:
If vehicle speed increases, the width of amplitude (W) decreases.

NOTE:
The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.
<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0], or 4-4d [T6D2] or [T9J0].>

8. Diagnostic Chart with Select Monitor

A: BASIC DIAGNOSTIC CHART

If no trouble codes appear in the on-board diagnostic operation (although problems have occurred or are occurring), measure performance characteristics of sensors, actuators, etc., in the “F” mode (select monitor function), and compare with the “basic data” to determine the cause of problems.



B: LIST OF OUTPUT MODES

1. FUNCTION MODE

Mode	Contents	Abbr.	Unit	Contents of display	Page
F00	Mode display	—	—	AT or EGI mode (when monitor is connected.)	57
F01	Battery voltage	VB	V	Battery voltage applied to control unit.	57
F02	Vehicle speed sensor 1	VSP1	m/h	Vehicle speed (miles/h) sent from vehicle speed sensor 1.	58
F03	Vehicle speed sensor 1	VSP1	km/h	Vehicle speed (km/h) sent from vehicle speed sensor 1.	58
F04	Vehicle speed sensor 2	VSP2	m/h	Vehicle speed (miles/h) sent from vehicle speed sensor 2.	58
F05	Vehicle speed sensor 2	VSP2	km/h	Vehicle speed (km/h) sent from vehicle speed sensor 2.	58
F06	Engine speed	EREV	rpm	Engine speed sent from ECM.	59
F07	ATF temperature sensor	ATFT	°F	ATF temperature (°F) sent from ATF temperature sensor.	59
F08	ATF temperature sensor	ATFT	°C	ATF temperature (°C) sent from ATF temperature sensor.	59
F09	Throttle position sensor	THV	V	Voltage sent from throttle position sensor.	60
F10	Gear position	GEAR	—	Transmission gear position	60
F11	Line pressure duty	PLDTY	%	Duty ratio flowing through duty solenoid A.	61
F12	Lock-up duty	LUDTY	%	Duty ratio flowing through duty solenoid B.	62
F13	AWD duty	4WDTY	%	Duty ratio flowing through duty solenoid C.	63
F14	Throttle position sensor power supply	THVCC	V	Power supply voltage to throttle position sensor	64
F15	Mass air flow signal	AFM	V	Output voltage from air flow sensor	64

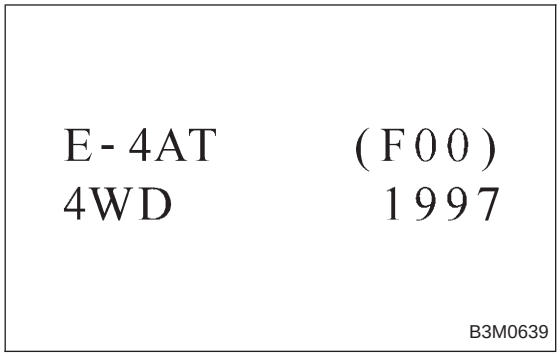
2. ON ←→ OFF SIGNAL LIST

Mode	LED No.	Signal name	Display	LED "ON" requirements	Page
FA0	1	FWD switch	FF	When fuse is installed in FWD switch.	—
	2	Kick-down switch	KD		—
	3	—	—		—
	4	—	—		—
	5	Brake switch	BR	When brake switch is turned ON.	—
	6	ABS switch	AB	When ABS signal is entered.	—
	7	Cruise control set	CR	When cruise control is set.	—
	8	Power switch	PW		—
	9	—	—		—
	10	—	—		—
FA1	1	P/N range switch	NP	When P or N range is selected.	—
	2	R range switch	RR	When R range is selected.	—
	3	D range switch	RD	When D range is selected.	—
	4	3 range switch	R3	When 3 range is selected.	—
	5	2 range switch	R2	When 2 range is selected.	—
	6	1 range switch	R1	When 1 range is selected.	—
	7	Diagnosis switch	SS	When diagnosis switch is turned ON.	66
	8	—	—		—
	9	—	—		—
	10	—	—		—

NOTE; LED Nos. 2 and 8 cannot be turned on.

3. DIAGNOSIS MODE

Mode	Contents	Abbr.	Contents of display
FB0	On-board diagnostics	DIAG.U	Current trouble code determined by on-board diagnostics.
FB1	On-board diagnostics	DIAG.M	Previous trouble code stored in memory by on-board diagnostics.
FC0	Back-up clear	—	Function of clearing trouble code stored in memory.



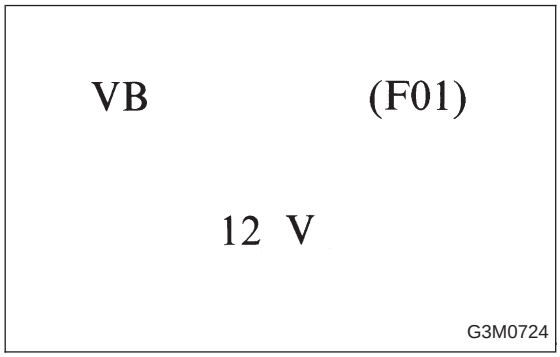
C: MODE F00 — MODE DISPLAY —

SPECIFIED DATA:

Data at the left should be indicated.

Probable cause (if outside “specified data”)

1. Communication failure (No communication method can be confirmed with power ON.)	(1)	Check loose or poor connectors, or shortcircuit.
	(2)	Check type of cartridge.
2. Vehicle types cannot be identified (due to communication failure).		Check improper cartridge. Replace with proper one.



D: MODE F01 — BATTERY VOLTAGE (VB) —

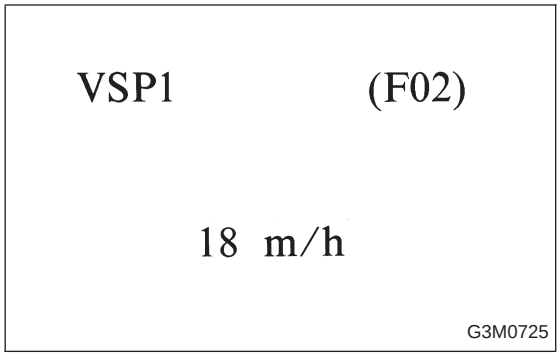
CONDITION:

- Ignition switch ON
- Engine idling after warm-up

SPECIFIED DATA:

VB: 10 — 16 V

1. Battery		Check battery voltage and specific gravity of electrolyte.
2. Charging system	(1)	Measure regulating voltage under no loads.
	(2)	Check generator (as a single unit).



E: MODE F02
— VEHICLE SPEED SENSOR 1 (VSP1) —

F03 = vehicle speed (VSP1): to be indicated in "km/h".

CONDITION:

Raise vehicle off ground and operate at constant speed.

SPECIFIED DATA:

Compare speedometer with monitor indications.

Probable cause (if outside "specified data")

1. Vehicle speed sensor 1	Check performance characteristics of vehicle speed sensor 1. <Ref. to 3-2 [T7L0].>
	OK
	Check TCM and replace if necessary.

F: MODE F04
— VEHICLE SPEED SENSOR 2 (VSP2) —

F05 = vehicle speed (VSP2): to be indicated in "km/h".

CONDITION:

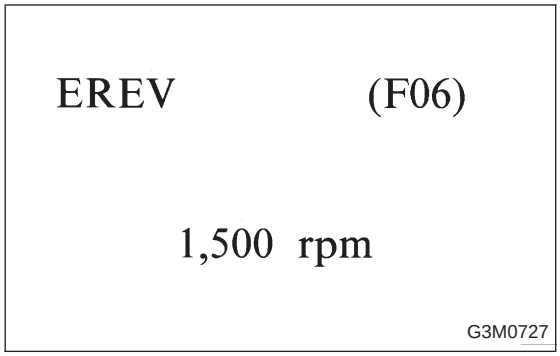
Raise vehicle off ground and operate at constant speed.

SPECIFIED DATA:

Compare speedometer with monitor indications.

Probable cause (if outside "specified data")

1. Vehicle speed sensor 2	Check performance characteristics of vehicle speed sensor 2. <Ref. to 3-2 [T7M0].>
	OK
	Check TCM and replace if necessary.



G: MODE F06 — ENGINE SPEED (EREV) —

CONDITION:

Measure with engine operating at constant speed.

SPECIFIED DATA:

Same as tachometer reading (in combination meter)

Probable cause (if outside “specified data”)

1. Conduct diagnostics in relation to MPFI system for engine speed.	OK →	Check TCM and replace if necessary.

H: MODE F07 — ATF TEMPERATURE SENSOR (ATFT) —

F08 = ATF temperature (ATFT): to be indicated in “deg C”.

CONDITION:

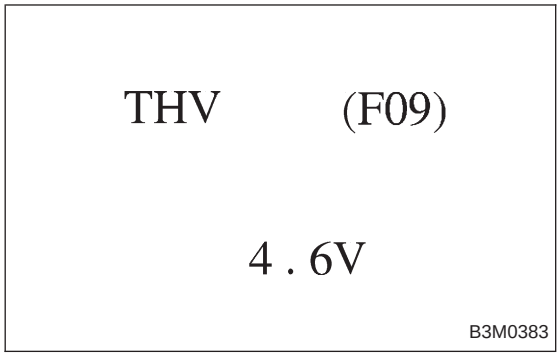
- Low ATF temperature (before engine/vehicle starts.)
- High ATF temperature (after driving vehicle for warm-up.)

SPECIFIED DATA:

- Ambient temperature: ±50°F (±10°C) (Low ATF temperature)
- ATF temperature: 158 — 230°F (70 — 110°C) (High ATF temperature)
- Open harness: 176 deg F (80 deg C)
- Shorted harness: 320 deg F (160 deg C)

Probable cause (if outside “specified data”)

1. ATF temperature sensor	→	Check performance characteristics of ATF temperature sensor. <Ref. to 3-2 [T7F0].>
		OK ↓
		Check TCM and replace if necessary.



I: MODE F09 — THROTTLE POSITION SENSOR (THV) —

CONDITION:

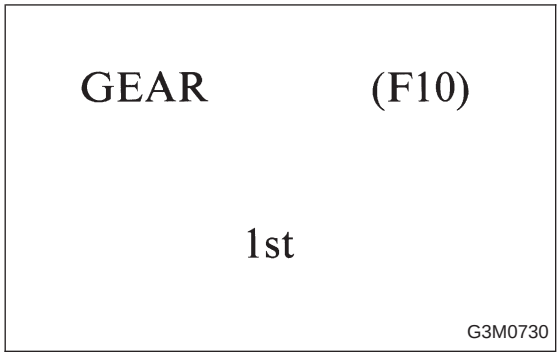
- Ignition switch ON (with engine OFF)
- Measure voltage while operating throttle valve from a fully closed position to a fully open position.

SPECIFIED DATA:

- Fully closed position: 0.5±0.2 V
- Fully open position: 4.6±0.3 V
- From fully closed to fully open position: Voltage must smoothly decrease.
- Open harness: 5.0±0.3 V
- Shorted harness: 0.00 V

Probable cause (if outside “specified data”)

1. Throttle position sensor	Check performance characteristics of throttle position sensor. <Ref. to 3-2 [T7K0].>
	OK
	Check TCM and replace if necessary.



J: MODE F10 — GEAR POSITION (GEAR) —

CONDITION:

Check while driving vehicle (after warm-up).

SPECIFIED DATA:

Gear position (Refer to shift performance characteristics chart.)

Probable cause (item outside “specified data”)

1. Shift solenoid 1	Check performance characteristics of shift solenoid 1. <Ref. to 3-2 [T7E0].>
	OK
2. Shift solenoid 2	Check performance characteristics of shift solenoid 2. <Ref. to 3-2 [T7D0].>
	OK
3. Shift solenoid 3	Check performance characteristics of shift solenoid 3. <Ref. to 3-2 [T7C0].>
	OK
	Check TCM and replace as necessary.

K: MODE F11
— LINE PRESSURE DUTY (PLDTY) —

CONDITION:

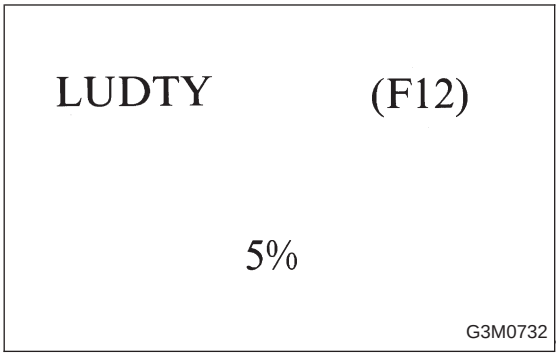
- After sufficient warm-up
- Ignition ON (engine OFF)
- N range

SPECIFIED DATA:

- Throttle fully closed: 100%
- Throttle fully open : 15% or less

Probable cause (if outside “specified data”)

1. Throttle position sensor	Check in F09 mode. <Ref. to 3-2 [T8I0].>
	OK
2. Vehicle speed sensor 1	Check in F02 mode. <Ref. to 3-2 [T8E0].>
	OK
3. Vehicle speed sensor 2	Check in F04 mode. <Ref. to 3-2 [T8F0].>
	OK
4. Engine speed	Check in F06 mode. <Ref. to 3-2 [T8G0].>
	OK
5. ATF temperature sensor	Check in F07 mode. <Ref. to 3-2 [T8H0].>
	OK
6. Inhibitor switch	Check for operation.
	OK
	Check TCM and replace if necessary.



L: MODE F12 — LOCK-UP DUTY (LUDTY) —

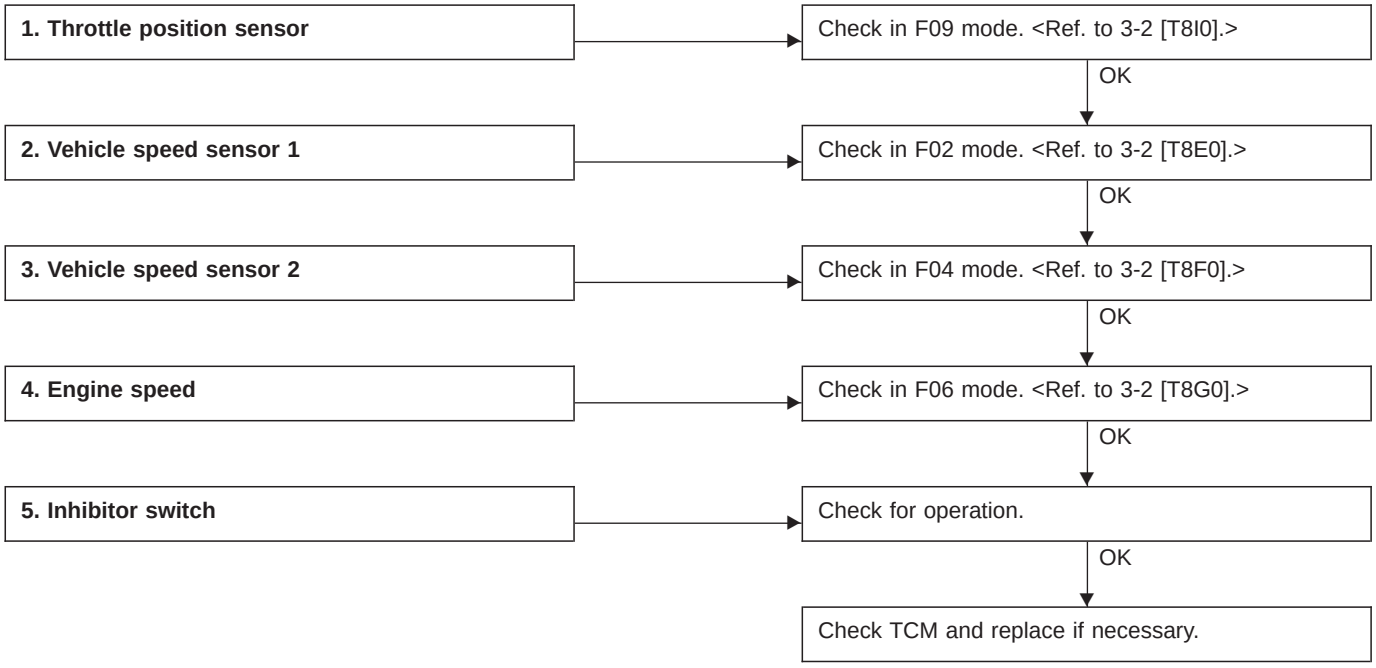
CONDITION:

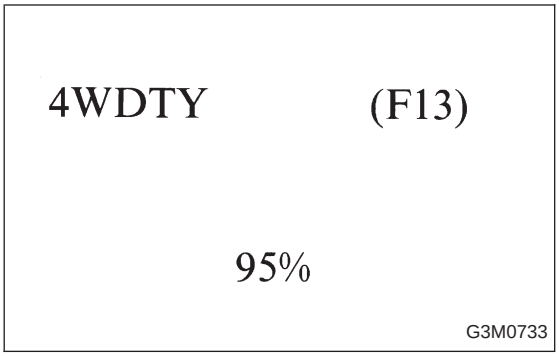
- Idling (after sufficient warm-up) with lock-up system released.
- Driving at 75 km/h (47 MPH) (after sufficient warm-up) with lock-up system applied.

SPECIFIED DATA:

- Lock-up system released: 5%
- Lock-up system applied: 95%

Probable cause (if outside “specified data”)





M: MODE F13 — AWD DUTY (4WDTY) —

CONDITION:

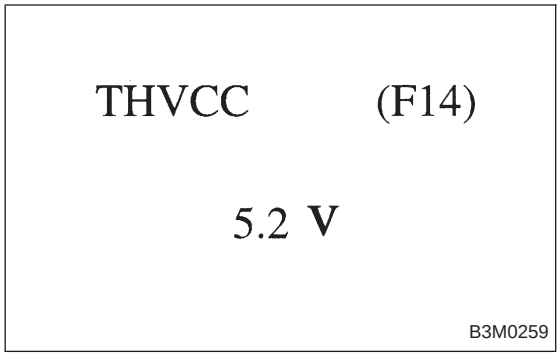
- After sufficient warm-up
- Ignition switch ON (engine OFF)
- FWD mode
- AWD mode, D range, full throttle

SPECIFIED DATA:

- 95% (FWD mode)
- 25%, max. (vehicle speed 0 m/h) (AWD mode)

Probable cause (if outside “specified data”)

1. Throttle position sensor	→	Check in F09 mode. <Ref. to 3-2 [T8I0].>
		OK ↓
2. Vehicle speed sensor 1	→	Check in F02 mode. <Ref. to 3-2 [T8E0].>
		OK ↓
3. Vehicle speed sensor 2	→	Check in F04 mode. <Ref. to 3-2 [T8F0].>
		OK ↓
4. ATF temperature sensor	→	Check in F07 mode. <Ref. to 3-2 [T8H0].>
		OK ↓
5. Inhibitor switch	→	Check for operation.
		OK ↓
6. ABS signal	→	Check ABS system for operation.
		OK ↓
		Check TCM and replace if necessary.



N: MODE F14 — THROTTLE POSITION SENSOR POWER SUPPLY (THVCC) —

CONDITION:

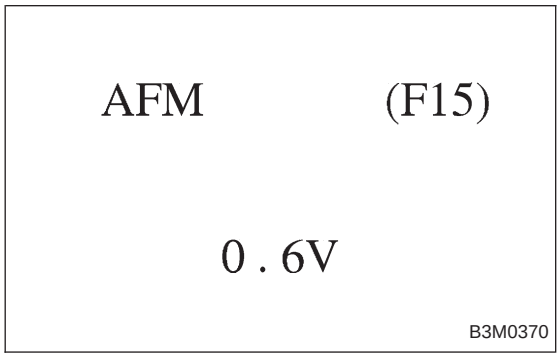
Ignition switch ON (engine OFF)

SPECIFIED DATA:

5.12±0.1 V

Probable cause (Item outside “specified data”)

1. Throttle position sensor power supply	Check throttle sensor line. <Ref. to 3-2 [T7K0].> → OK → Check TCM and replace if necessary.



O: MODE F15 — MASS AIR FLOW SIGNAL (AFM) —

CONDITION:

- Ignition switch ON (engine ON)
- N range
- Idling

SPECIFIED DATA:

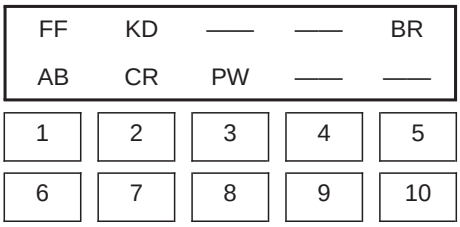
Engine warm-up: 0.5 — 1.22 V

Probable cause (if outside “specified data”)

1. Mass air flow signal	Check performance characteristics of mass air flow signal. <Ref. to 3-2 [T7G0].> → OK → Check TCM and replace if necessary.

DISPLAY

LED No.	Signal name	Symbol
1	FWD switch	FF
2	Kick-down switch	KD
3	—	—
4	—	—
5	Brake	BR
6	ABS switch	AB
7	Cruise control set	CR
8	Power switch	PW
9	—	—
10	—	—



P: MODE FA0 — SWITCH 1 (SW1) —

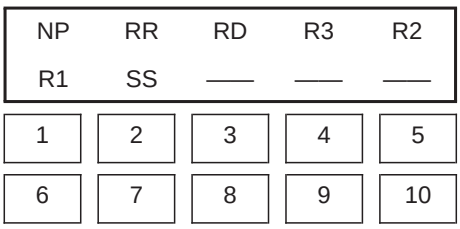
Reference values

- Lights up when the fuse is installed in FWD switch (No. 1).
- Light up when the brake pedal is depressed (No. 5).
- Light up when the ABS signal is entered (No. 6).
- Lights up when the cruise control is set (No. 7).

NOTE:
LED Nos. 2 and 8 do not come on.

DISPLAY

LED No.	Signal name	Symbol
1	N/P range switch	NP
2	R range switch	RR
3	D range switch	RD
4	3 range switch	R3
5	2 range switch	R2
6	1 range switch	R1
7	Diagnosis switch	SS
8	—	—
9	—	—
10	—	—



Q: MODE FA1 — SWITCH 2 (SW2) —

Reference values

- Lights up when the N or P range is selected (No. 1).
- Lights up when the R range is selected (No. 2).
- Lights up when the D range is selected (No. 3).
- Lights up when the 3 range is selected (No. 4).
- Lights up when the 2 range is selected (No. 5).
- Lights up when the 1 range is selected (No. 6).
- Lights up when the diagnosis switch is connected (No. 7).

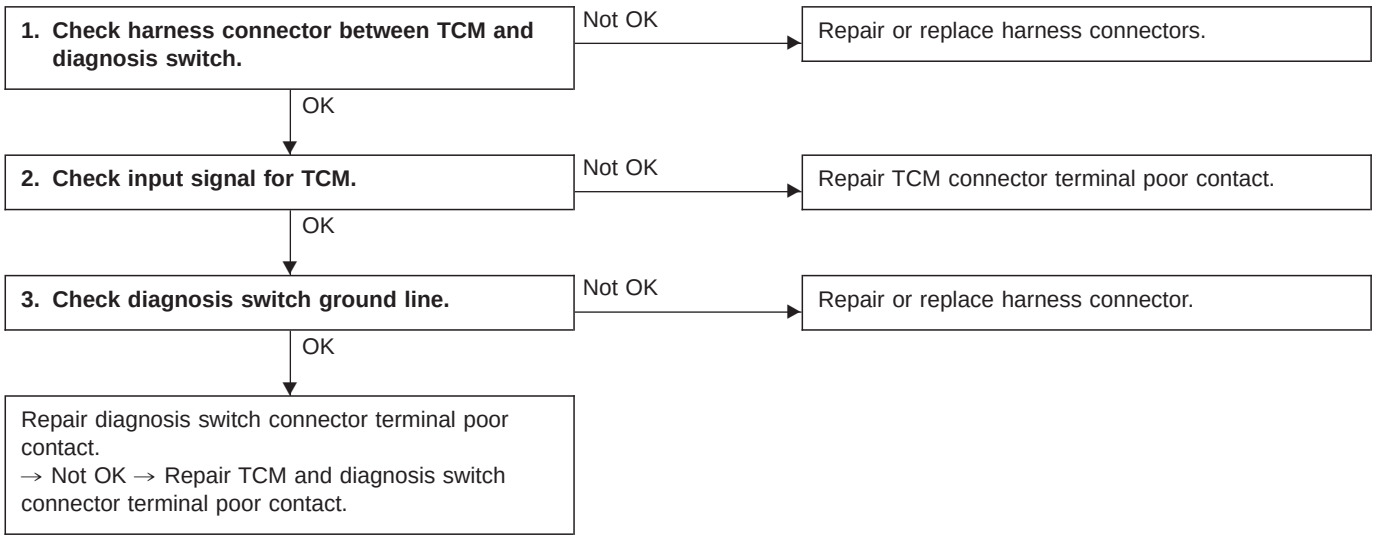
NOTE:
If each LED does not illuminate in the above conditions, inhibitor switch malfunction may occur. Perform diagnostics on inhibitor switch. <Ref. to 2-7 [T10BI0], [T11BI0].>

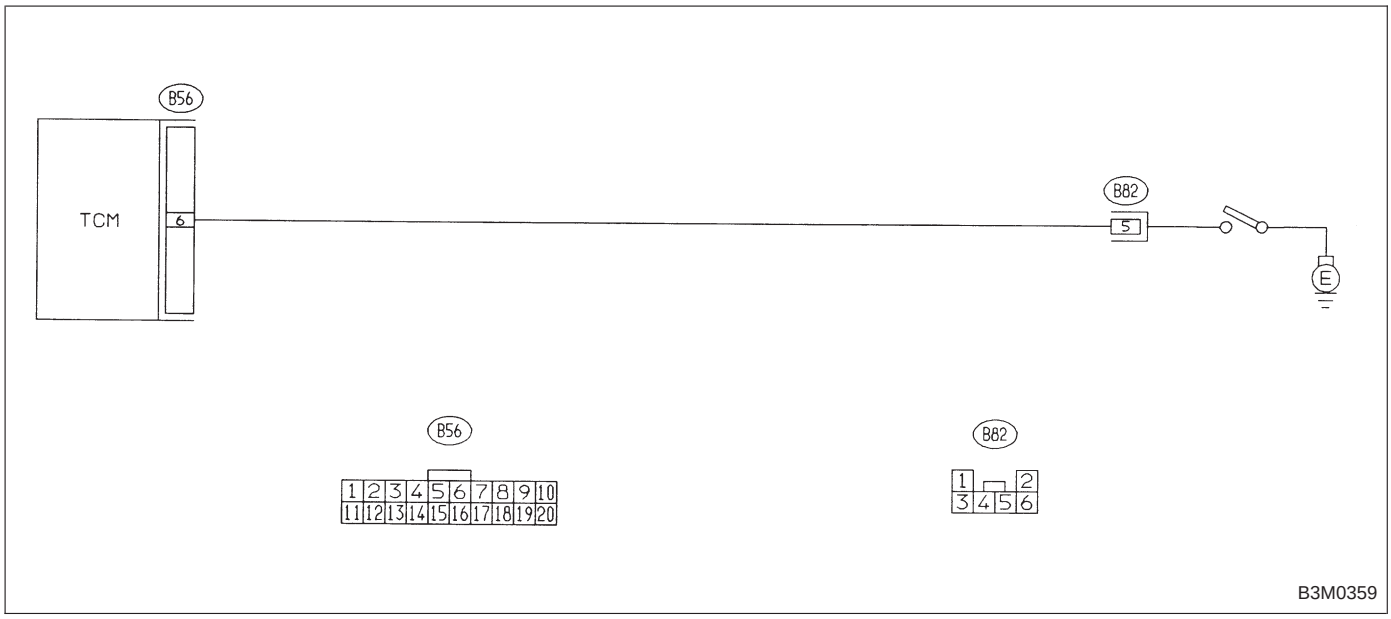
R: MODE FA1
— LED No. 7, DIAGNOSIS SWITCH —

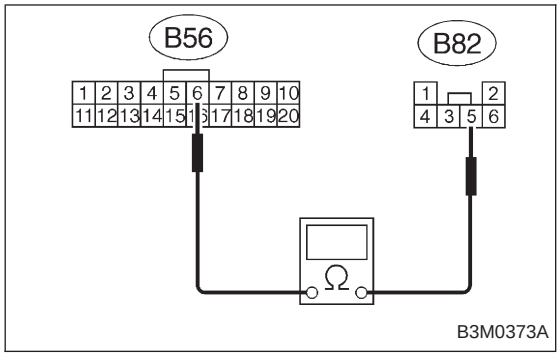
DIAGNOSIS:

- LED does not come on when diagnosis switch is ON.
- Diagnosis switch circuit is open or shorted.

Probable cause (if outside “specified data”)



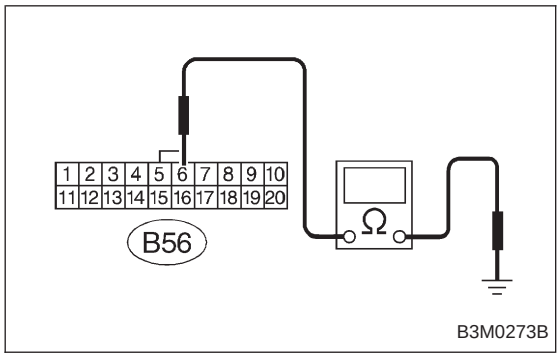




1. CHECK HARNESS CONNECTOR BETWEEN TCM AND DIAGNOSIS SWITCH.

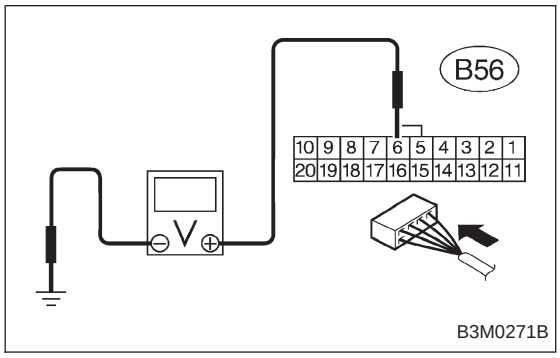
1) Turn ignition switch OFF.
2) Disconnect connector from TCM.
3) Measure resistance of harness connector between TCM and diagnosis switch.

Connector & terminal / Specified resistance:
(B56) No. 6 — (B82) No. 5 / 1 Ω, or less.



4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

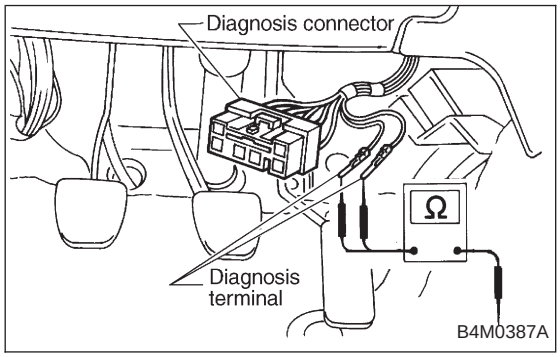
Connector & terminal / Specified resistance:
(B56) No.6 — Body / 1 M Ω, or more



2. CHECK INPUT SIGNAL FOR TCM.

1) Connect connector to TCM.
2) Turn ignition switch ON (with engine OFF).
3) Measure signal voltage for TCM while connecting and disconnecting the diagnosis terminal to diagnosis connector.

Connector & terminal / Specified voltage:
(B56) No. 6 — Body / Less than 1 V (Connected)
More than 6 V (Disconnected)



3. CHECK DIAGNOSIS SWITCH GROUND LINE.

Measure resistance of harness terminal between diagnosis terminal and body.

Connector & terminal / Specified resistance:
(B81) — Body / 1 Ω, or less

9. General Diagnostic Table

Problem parts / Symptom	Inhibitor switch	Control module	Vehicle speed sensor 1	Vehicle speed sensor 2	Select cable	Select lever	FWD switch	Starter motor and harness	Throttle position sensor	Diagnosis switch	Accumulator ("N" — "D")	Accumulator (2A)	Accumulator (4A)	Accumulator (3R)	ATF temperature sensor	Strainer	Duty solenoid A	Duty solenoid B	Shift solenoid 1	Shift solenoid 2	Shift solenoid 3	Control valve	Detent spring	Manual plate	Transfer clutch	Transfer valve	Transfer pipe	Duty solenoid C	Forward clutch
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Starter does not rotate when select lever is in "P" or "N."; starter rotates when select lever is "R", "D", "3" or "2."	X				X	X		X																					
Abnormal noise when select lever is in "P" or "N."																X												X	
Hissing noise occurs during standing starts.																X													
Noise occurs while driving in "D_1" range.																													
Noise occurs while driving in "D_2" range.																													
Noise occurs while driving in "D_3" range.																													
Noise occurs while driving in "D_4" range.																													
Engine stalls while shifting from one range to another.																						X							
Vehicle moves when select lever is in "N."																													X
Shock occurs when select lever is moved from "N" to "D."		X									X											X							
Excessive time lag occurs when select lever is moved from "N" to "D."																						X							X
Shock occurs when select lever is moved from "N" to "R."		X											X									X							
Excessive time lag occurs when select lever is moved from "N" to "R."																						X							
Vehicle does not start in any shift range (engine revving up).																X						X							
Vehicle does not start in any shift range (engine stall).																													
Vehicle does not start in "R" range only (engine revving up).					X	X																X							
Vehicle does not start in "R" range only (engine stall).																													X
Vehicle does not start in "D" or "3" range (engine revving up).																													X
Vehicle does not start in "D", "3" or "2" range (engine revving up).																													X
Vehicle does not start in "D", "3" or "2" range (engine stall).																													
Vehicle starts in "R" range only (engine revving up).																						X							
Acceleration during standing starts is poor (high stall rpm).																						X							X
Acceleration during standing starts is poor (low stall rpm).																													
Acceleration is poor when select lever is in "D", "3" or "2" range (normal stall rpm).		X																				X							
Acceleration is poor when select lever is in "R" (normal stall rpm).																						X							
No shift occurs from 1st to 2nd gear.		X	X	X					X										X	X		X							
No shift occurs from 2nd to 3rd gear.		X																				X							
No shift occurs from 3rd to 4th gear.		X												X	X						X	X							
No "kick-down" shifts occur.		X							X																				
Engine brake is not effected when select lever is in "3" range.	X	X							X													X							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29

Overrunning clutch	Drive pinion	Crown gear	Axle shaft	Differential gear	Final gear	Seal pipe	Oil pump	High clutch	Band brake	Low & reverse clutch	Reverse clutch	One-way clutch (1-2)	One-way clutch (3-4)	Double oil seal	Input shaft	Output shaft	Planetary gear	Reduction gear	Drive plate	Torque converter one-way clutch	Lock-up facing	Lock-up damper	ATF deterioration	ATF level too high or too low	Differential gear oil level too high or too low	Engine performance	Engine speed signal	Parking brake mechanism	Problem parts
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	Symptom
																													Starter does not rotate when select lever is in “P” or “N.”; starter rotates when select lever is “R”, “D”, “3” or “2.”
							X												X					X					Abnormal noise when select lever is in “P” or “N.”
																								X					Hissing noise occurs during standing starts.
					X												X	X							X				Noise occurs while driving in “D_1” range.
					X												X	X							X				Noise occurs while driving in “D_2” range.
					X													X							X				Noise occurs while driving in “D_3” range.
					X												X	X							X				Noise occurs while driving in “D_4” range.
																						X				X			Engine stalls while shifting from one range to another.
																													Vehicle moves when select lever is in “N.”
																							X						Shock occurs when select lever is moved from “N” to “D.”
																													Excessive time lag occurs when select lever is moved from “N” to “D.”
																							X						Shock occurs when select lever is moved from “N” to “R.”
										X	X																		Excessive time lag occurs when select lever is moved from “N” to “R.”
	X	X	X	X			X								X	X	X		X					X					Vehicle does not start in any shift range (engine revving up).
																												X	Vehicle does not start in any shift range (engine stall).
										X	X																		Vehicle does not start in “R” range only (engine revving up).
									X								X												Vehicle does not start in “R” range only (engine stall).
												X																	Vehicle does not start in “D” or “3” range (engine revving up).
																													Vehicle does not start in “D”, “3” or “2” range (engine revving up).
											X																		Vehicle does not start in “D”, “3” or “2” range (engine stall).
																													Vehicle starts in “R” range only (engine revving up).
											X														X				Acceleration during standing starts is poor (high stall rpm).
							X													X						X			Acceleration during standing starts is poor (low stall rpm).
								X	X								X												Acceleration is poor when select lever is in “D”, “3” or “2” range (normal stall rpm).
X								X	X								X												Acceleration is poor when select lever is in “R” (normal stall rpm).
									X																				No shift occurs from 1st to 2nd gear.
								X					X																No shift occurs from 2nd to 3rd gear.
									X																				No shift occurs from 3rd to 4th gear.
																													No “kick-down” shifts occur.
																													Engine brake is not effected when select lever is in “3” range.
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	

9. General Diagnostic Table

Problem parts / Symptom	Inhibitor switch	Control module	Vehicle speed sensor 1	Vehicle speed sensor 2	Select cable	Select lever	FWD switch	Starter motor and harness	Throttle position sensor	Diagnosis switch	Accumulator ("N" — "D")	Accumulator (2A)	Accumulator (4A)	Accumulator (3R)	ATF temperature sensor	Strainer	Duty solenoid A	Duty solenoid B	Shift solenoid 1	Shift solenoid 2	Shift solenoid 3	Control valve	Detent spring	Manual plate	Transfer clutch	Transfer valve	Transfer pipe	Duty solenoid C	Forward clutch
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Engine brake is not effected when select lever is in "3" or "2" range.																													
Engine brake is not effected when select lever is in "1" range.																						X							
Shift characteristics are erroneous.	X	X	X	X					X													X							
No lock-up occurs.		X							X						X							X							
Vehicle cannot be set in "D" range power mode.		X							X																				
"D" range power mode cannot be released.		X							X						X														
Parking brake is not effected.					X	X																							
Shift lever cannot be moved or is hard to move from "P" range.					X	X																							
Select lever is hard to move.					X	X																	X	X					
Select lever is too light to move (unreasonable resistance).																							X	X					
ATF spurts out.																													
Differential oil spurts out.																													
Differential oil level changes excessively.																													
Odor is produced from oil supply pipe.																									X				X
Shock occurs when select lever is moved from "1" to "2" range.		X							X			X			X		X					X							
Slippage occurs when select lever is moved from "1" to "2" range.		X							X			X			X		X					X							
Shock occurs when select lever is moved from "2" to "3" range.		X							X					X	X		X					X							
Slippage occurs when select lever is moved from "2" to "3" range.		X							X					X	X		X					X							
Shock occurs when select lever is moved from "3" to "4" range.		X							X				X		X		X					X							
Slippage occurs when select lever is moved from "3" to "4" range.		X							X				X		X		X					X							
Shock occurs when select lever is moved from "3" to "2" range.		X							X						X		X					X							
Shock occurs when select lever is moved from "D" to "1" range.		X							X						X		X					X							
Shock occurs when select lever is moved from "2" to "1" range.		X							X						X		X					X							
Shock occurs when accelerator pedal is released at medium speeds.		X							X						X		X					X							
Vibration occurs during straight-forward operation.		X																X											
Select lever slips out of position during acceleration or while driving on rough terrain.					X	X																	X	X					
Vibration occurs during turns (tight corner "braking" phenomenon).		X	X	X					X						X										X	X		X	
Front wheel slippage occurs during standing starts.		X		X			X		X						X							X			X	X	X	X	
Vehicle is not set in FWD mode.		X					X																		X	X		X	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29

Overrunning clutch	Drive pinion	Crown gear	Axle shaft	Differential gear	Final gear	Seal pipe	Oil pump	High clutch	Band brake	Low & reverse clutch	Reverse clutch	One-way clutch (1-2)	One-way clutch (3-4)	Double oil seal	Input shaft	Output shaft	Planetary gear	Reduction gear	Drive plate	Torque converter one-way clutch	Lock-up facing	Lock-up damper	ATF deterioration	ATF level too high or too low	Differential gear oil level too high or too low	Engine performance	Engine speed signal	Parking brake mechanism	Problem parts
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	Symptom
X																													Engine brake is not effected when select lever is in “3” or “2” range.
										X																			Engine brake is not effected when select lever is in “1” range.
																													Shift characteristics are erroneous.
																					X						X		No lock-up occurs.
																													Vehicle cannot be set in “D” range power mode.
																													“D” range power mode cannot be released.
																												X	Parking brake is not effected.
																												X	Shift lever cannot be moved or is hard to move from “P” range.
																													Select lever is hard to move.
																													Select lever is too light to move (unreasonable resistance).
																								X					ATF spurts out.
																									X				Differential oil spurts out.
						X								X															Differential oil level changes excessively.
X								X	X	X	X										X		X						Odor is produced from oil supply pipe.
									X														X			X			Shock occurs when select lever is moved from “1” to “2” range.
									X																				Slippage occurs when select lever is moved from “1” to “2” range.
								X	X														X			X			Shock occurs when select lever is moved from “2” to “3” range.
								X	X																				Slippage occurs when select lever is moved from “2” to “3” range.
X									X														X			X			Shock occurs when select lever is moved from “3” to “4” range.
									X																				Slippage occurs when select lever is moved from “3” to “4” range.
X									X														X						Shock occurs when select lever is moved from “3” to “2” range.
																							X						Shock occurs when select lever is moved from “D” to “1” range.
										X													X						Shock occurs when select lever is moved from “2” to “1” range.
																						X				X			Shock occurs when accelerator pedal is released at medium speeds.
																					X	X							Vibration occurs during straight-forward operation.
																													Select lever slips out of position during acceleration or while driving on rough terrain.
																							X						Vibration occurs during turns (tight corner “braking” phenomenon).
																													Front wheel slippage occurs during standing starts.
																													Vehicle is not set in FWD mode.
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	

1. Supplemental Restraint System “Airbag”

Airbag system wiring harness is routed near the ABS/TCS control module, ABS sensor and hydraulic control unit.

CAUTION:
● All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
● Be careful not to damage Airbag system wiring harness when servicing the ABS/TCS control module, ABS sensor and hydraulic control unit.

2. Pre-inspection

Before performing diagnostics, check the following items which might affect ABS/TCS problems:

A: MECHANICAL INSPECTION

1. POWER SUPPLY

1) Measure battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V, or more
Specific gravity: Above 1.260

2) Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

2. BRAKE FLUID

1) Check brake fluid level.
2) Check brake fluid leakage.

3. BRAKE DRAG

Check brake drag. <Ref. to 4-4 [K100].>

4. BRAKE PAD AND ROTOR

Check brake pad and rotor. <Ref. to 4-4 [K100].>

5. TIRE SPECIFICATIONS, TIRE WEAR AND AIR PRESSURE

Check tire specifications, tire wear and air pressure. <Ref. to 4-2 [S1A0].>

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1) Check brake fluid level.
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3. BRAKE DRAG

Check brake drag. <Ref. to 4-4 [K100].>

4. BRAKE PAD AND ROTOR

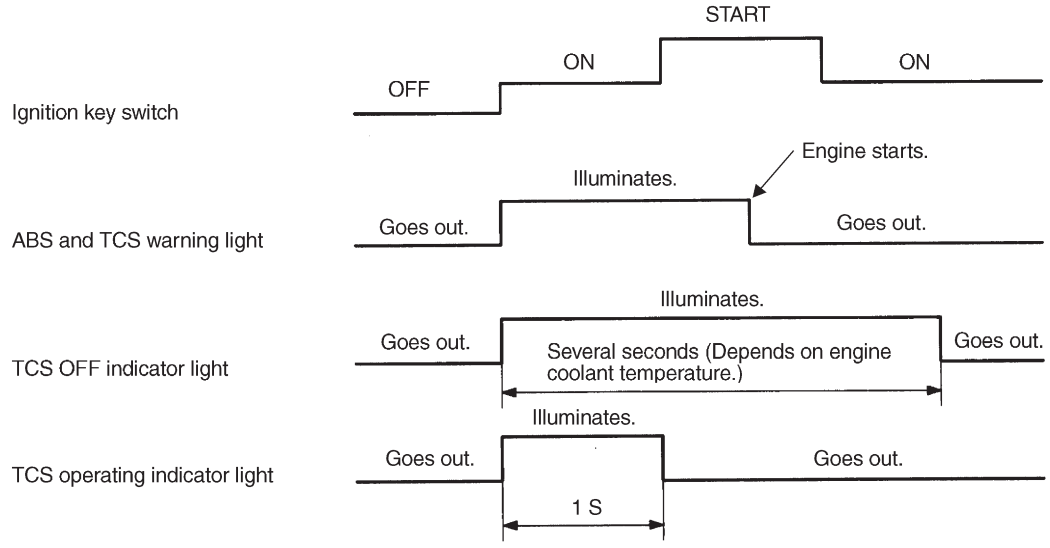
Check brake pad and rotor. <Ref. to 4-4 [K100].>

5. TIRE SPECIFICATIONS, TIRE WEAR AND AIR PRESSURE

Check tire specifications, tire wear and air pressure. <Ref. to 4-2 [S1A0].>

B: ELECTRICAL INSPECTION

1. WARNING LAMP ILLUMINATION PATTERN

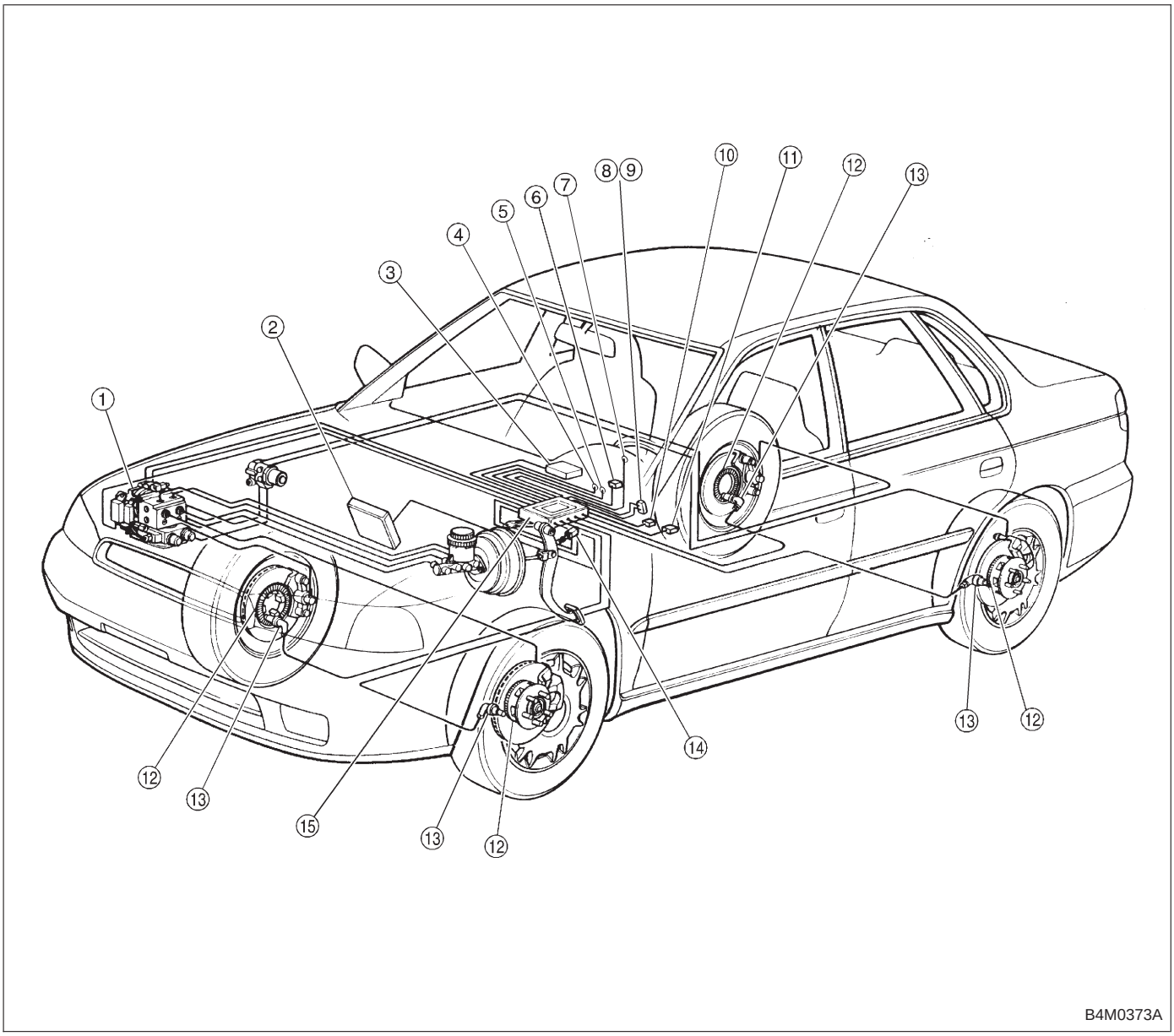


2. DISPLAY SYSTEM TYPE AND LIGHTING CONDITIONS

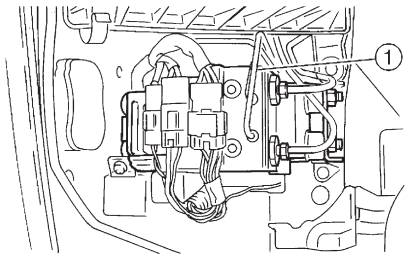
◯: Illuminated

Mode	ABS warning	TCS warning	TCS OFF	TCS operating	Lighting conditions
Bulb check	◯	◯			Illuminated with IGN. ON, extinguished with E/G RUN
			◯		Illuminated with IGN. ON, extinguished after a few seconds.
				◯	Illuminated with IGN. ON, extinguished after 1 second.
ABS failure	◯	◯			Illuminated during ABS failure (ABS and TCS functions stop)
TCS failure		◯			Illuminated during TCS failure (Only TCS functions stop)
TCS OFF			◯		Illuminated when TCS operation is prohibited by E/G (low temperature, high temperature, etc.); illuminated during TCS OFF conditions resulting from operation of TCS OFF SW.
TCS operation				◯	Illuminated during TCS operation
Pad temperature warning			◯		Illuminated when pad temperature reaches 400°C (752°F) or more when TCS is functioning, and extinguished when temperature drops below 350°C (662°F).

3. Electrical Components Location



① Hydraulic control unit
② Engine control module
③ AT control module
④ TCS warning light
⑤ ABS warning light
⑥ Diagnosis connector
⑦ TCS operating indicator light
⑧ TCS OFF indicator light
⑨ TCS OFF switch
⑩ Data link connector (for Subaru select monitor)
⑪ Data link connector (for Subaru select monitor and OBD-II general scan tool)
⑫ Tone wheel
⑬ ABS sensor
⑭ Stroke sensor
⑮ ABS/TCS control module



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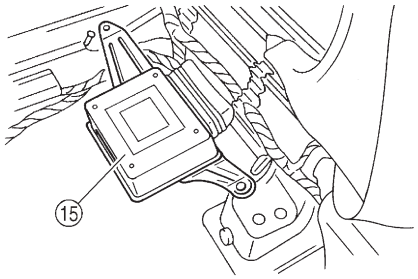

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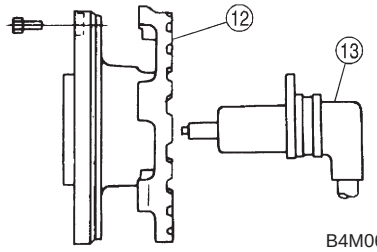

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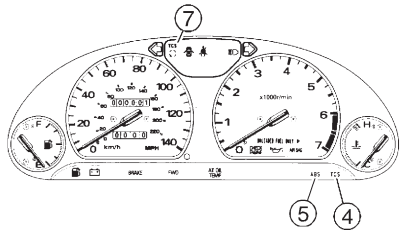

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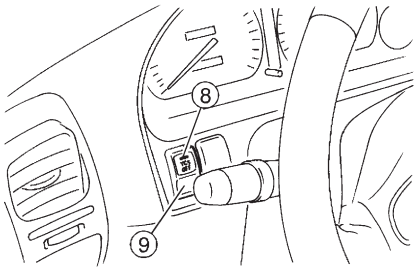

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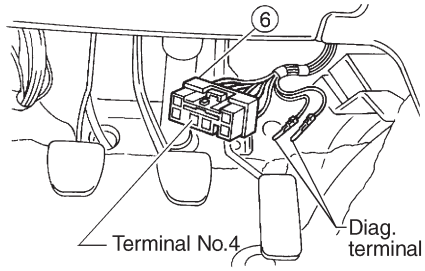

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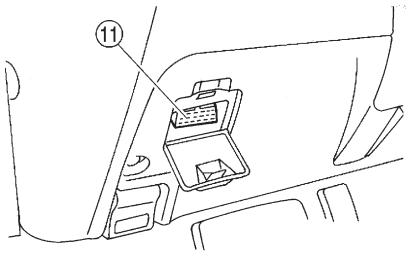

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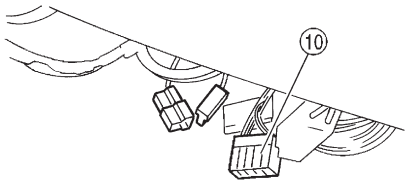

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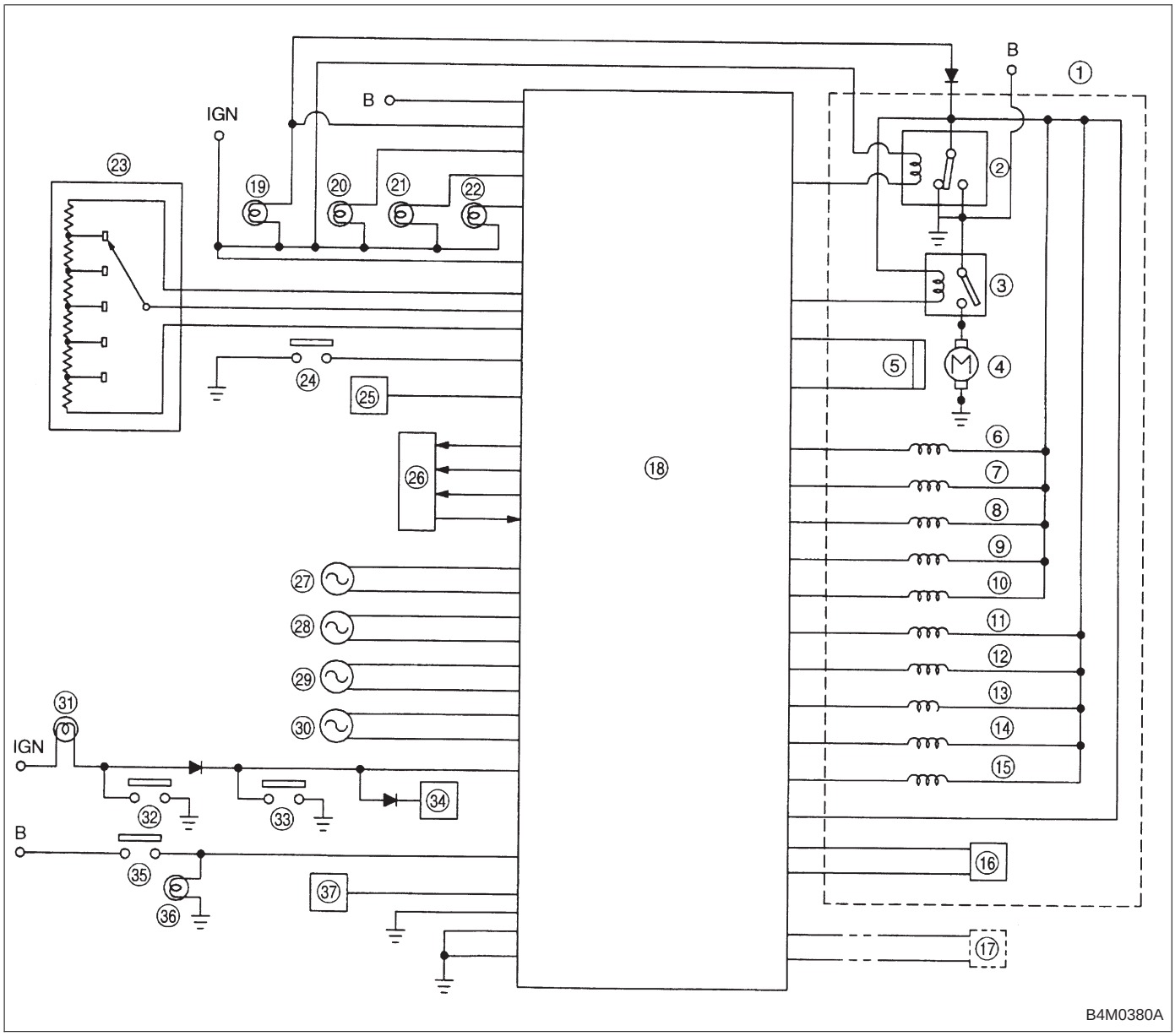
4. Schematic



① Hydraulic control unit
② Valve relay
③ Motor relay
④ Motor
⑤ Motor sensor
⑥ Front left inlet solenoid valve
⑦ Front left outlet solenoid valve
⑧ Rear right inlet solenoid valve
⑨ Rear right outlet solenoid valve
⑩ TCS solenoid valve 2
⑪ Front right inlet solenoid valve
⑫ Front right outlet solenoid valve
⑬ Rear left inlet solenoid valve
⑭ Rear left outlet solenoid valve
⑮ TCS solenoid valve 1
⑯ Pressure switch
⑰ Data link connector
⑱ ABS/TCS control module
⑲ ABS warning light
⑳ TCS operating indicator light
㉑ TCS OFF indicator light
㉒ TCS warning light
㉓ Stroke sensor
㉔ TCS OFF switch
㉕ Diagnosis connector
㉖ Engine control module
㉗ Rear right ABS sensor
㉘ Front right ABS sensor
㉙ Front left ABS sensor
㉚ Rear left ABS sensor
㉛ Brake warning light
㉜ Parking brake switch
㉝ Brake fluid level sensor
㉞ Generator
㉟ Stop lamp switch
㊱ Stop lamp
㊲ AT control module

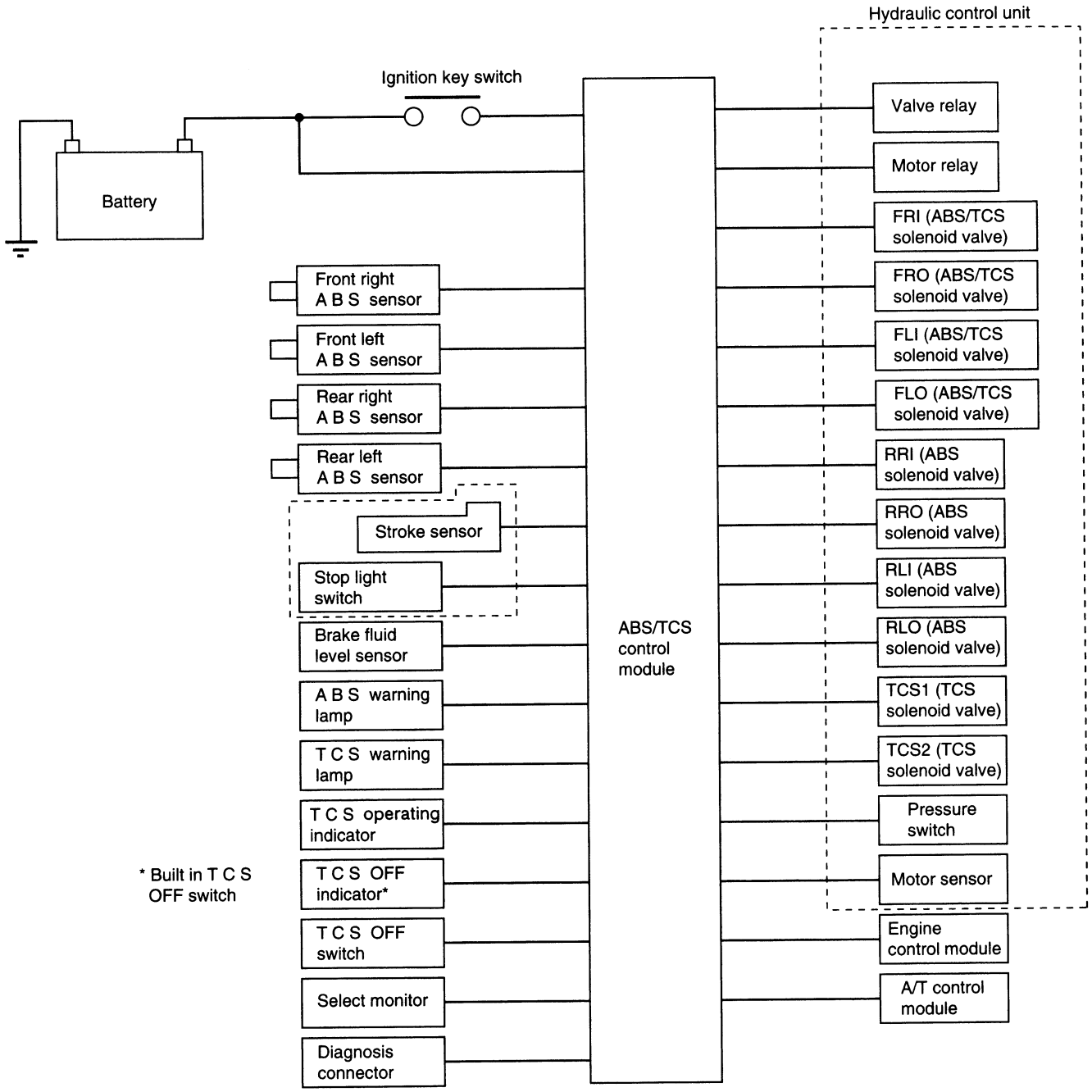
5. Control Module I/O Signal

1. I/O SIGNAL VOLTAGE

Contents			Connector No.	Terminal No.	Input/Output signals Measured value and measuring conditions
ABS sensor (Wheel speed sensor)	Front left wheel		P7	1—11	0.12 — 1 V (When it is 10 Hz.)
	Front right wheel		P6	8—16	0.12 — 1 V (When it is 10 Hz.)
	Rear left wheel		P6	7—15	0.12 — 1 V (When it is 10 Hz.)
	Rear right wheel		P7	2—12	0.12 — 1 V (When it is 10 Hz.)
Hydraulic unit	Solenoid valve	Front left outlet	P4	1—GND	10 — 14 V when the valve is OFF. Less than 1.5 V when the valve is ON.
		Front right outlet	P5	3—GND	
		Rear left outlet	P5	8—GND	
		Rear right outlet	P4	3—GND	
		Front left inlet	P4	2—GND	10 — 14 V when the valve is OFF. Less than 1.0 V when the valve is ON.
		Front right inlet	P5	2—GND	
		Rear left inlet	P5	7—GND	
		Rear right inlet	P4	4—GND	
		TCS 1	P4	5—GND	10 — 14 V when the valve is OFF. Less than 1.0 V when the valve is ON.
		TCS 2	P5	6—GND	
	Valve power supply		P6	6—GND	Ignition switch ON, 10 — 14 V
	Valve relay power supply		P6	1—GND	Less than 1.2 V when IGN is ON. 10 — 14 V when the system is down.
	Motor relay power supply		P6	9—GND	Less than 1.0 V when the motor is ON. 10 — 14 V when the motor is OFF.
	Motor sensor signals		P7	3—GND	Cyclic waveform of more than 180 Hz when the motor across terminals is ON. Less than 70 Hz when the motor is OFF.
			P7	13—GND	
	Pressure switch		P7	6—GND	H/L toggle signal with the brake pedal off (Cycle 14 mS, H: 10 —14 V, L: less than 0.7 V). 10 — 14 V with the brake pedal depressed.
Pedal stroke sensor	Output signals		P7	5—GND	0.7 — 0.9 V with the brake pedal off.
	Power supply		P7	4—14	5±0.4 V
Stop light switch	Switch		P7	7—GND	Less than 2 V when the stop light is off. 10 — 12 V when the stop light is on.
	Switch test signal		P7	18—GND	H/L toggle signal with the brake pedal off (Cycle 14 mS, H: 10 —12 V, L: less than 0.7 V). Less than 2 V with the brake pedal depressed.
TCS OFF switch			P7	16—GND	Less than 2.0 V with the switch pressed and 10 — 12 V with it released.
Indicator light	TCS OFF		P6	10—GND	Less than 2 V when the light is on and 10 — 12 V when it is off.
	TCS operation		P6	11—GND	
	TCS warning		P6	3—GND	
	ABS warning		P6	2—GND	

Contents		Connector No.	Terminal No.	Input/Output signals
				Measured value and measuring conditions
TCS control unit ECM communication	TCS → ECM communication (torque command)	P6	14—GND	Less than 0.7 V when the vehicle stands still.
	TCS → ECM communication (torque command)	P6	5—GND	Less than 5 V when the vehicle stands still.
	TCS → ECM communication (TCS operates)	P6	12—GND	4 — 5.4 V when TCS controls no operations. Less than 0.7 V when it controls operations.
	ECM → TCS communication (engine control)	P6	4—GND	H/L toggle signal with the accelerator pedal off (Cycle 20 mS, H: 10 — 14 V, L: less than 0.7 V). Less than 2.0 V with the accelerator pedal depressed. Also when TCS OFF indicator light comes on by TCS OFF switch.
ABS operation signal		P6	13—GND	10 — 14 V when the ABS control does not operate still and less than 0.7 V when ABS operates.
Fluid level sensor		P7	20—GND	Less than 2 V when IGN is ON and 10 — 14 V when idling.
Select monitor	Data is received.	P7	9—GND	4 — 4.5 V when no data is received.
	Data is sent.	P7	19—GND	4 — 4.5 V when no data is sent.
Diagnosis connector		P7	8—GND	10 — 14 V when IGN is ON.
Power supply	Ignition	P5	1—GND	10 — 14 V when IGN is ON.
	Battery	P5	4—GND	10 — 14 V
Grounding line	Power	P5	5—body	1 Ω or less
	Digital	P7	15—body	1 Ω or less
	Power	P4	6—body	1 Ω or less

2. I/O SIGNAL DIAGRAM



B4H0336

3. LIST OF ABS/TCS ON-BOARD DIAGNOSTICS FUNCTIONS

Trouble code	Diagnostic items <detailed diagnostic items>	Detection timing					Indicator light ON			Parts concerned
		At initial checking	Under no control	Under ABS control	Under TCS control	In diagnostic mode	ABS warning light	TCS warning light	TCS OFF indicator light	
21 FR 23 FL 25 RR 27 RL	Detection of fault in ABS sensor hardware <open/short circuits of sensor>	○	○	○	○		○	○	—	ABS sensor (ABS/TCS C/M)
22 FR 24 FL 26 RR 28 RL	Detection of fault in ABS sensor software <variations in wheel speed>		○	○	○		○	○	—	ABS sensor (ABS/TCS C/M)
			○	○	○		○	○	—	ABS sensor harness circuit (ABS/TCS C/M)
	Detection of fault in ABS sensor software <decompression mode>			○			○	○	—	ABS sensor and solenoid valve (ABS/TCS C/M)
				○			○	○	—	ABS sensor (ABS/TCS C/M)
	Detection of fault in sensor software <speed higher than prescribed>	○	○	○	○		○	○	—	ABS sensor (ABS/TCS C/M)
31 FRI 32 FRO 33 FLI 34 FLO 35 RRI 36 RRO 37 RLI 38 RLO 61 TCS1 62 TCS2	Abnormal valve <Abnormal valve>	○	○	○	○	○*	○	○	—	Solenoid valve (ABS/TCS C/M)
41	Abnormal ABS/TCS C/M <Abnormal ABS/TCS C/M>	○	○	○	○		○	○	—	ABS/TCS C/M
42	Abnormal line voltage <Abnormal line voltage>	○	○	○	○	○	○	○	—	Power source operating environment (ABS/TCS C/M)
—	Power source voltage drop <Power source voltage drop>	○	○	○	○		○	○	—	
		○	○	○	○	○	○		—	

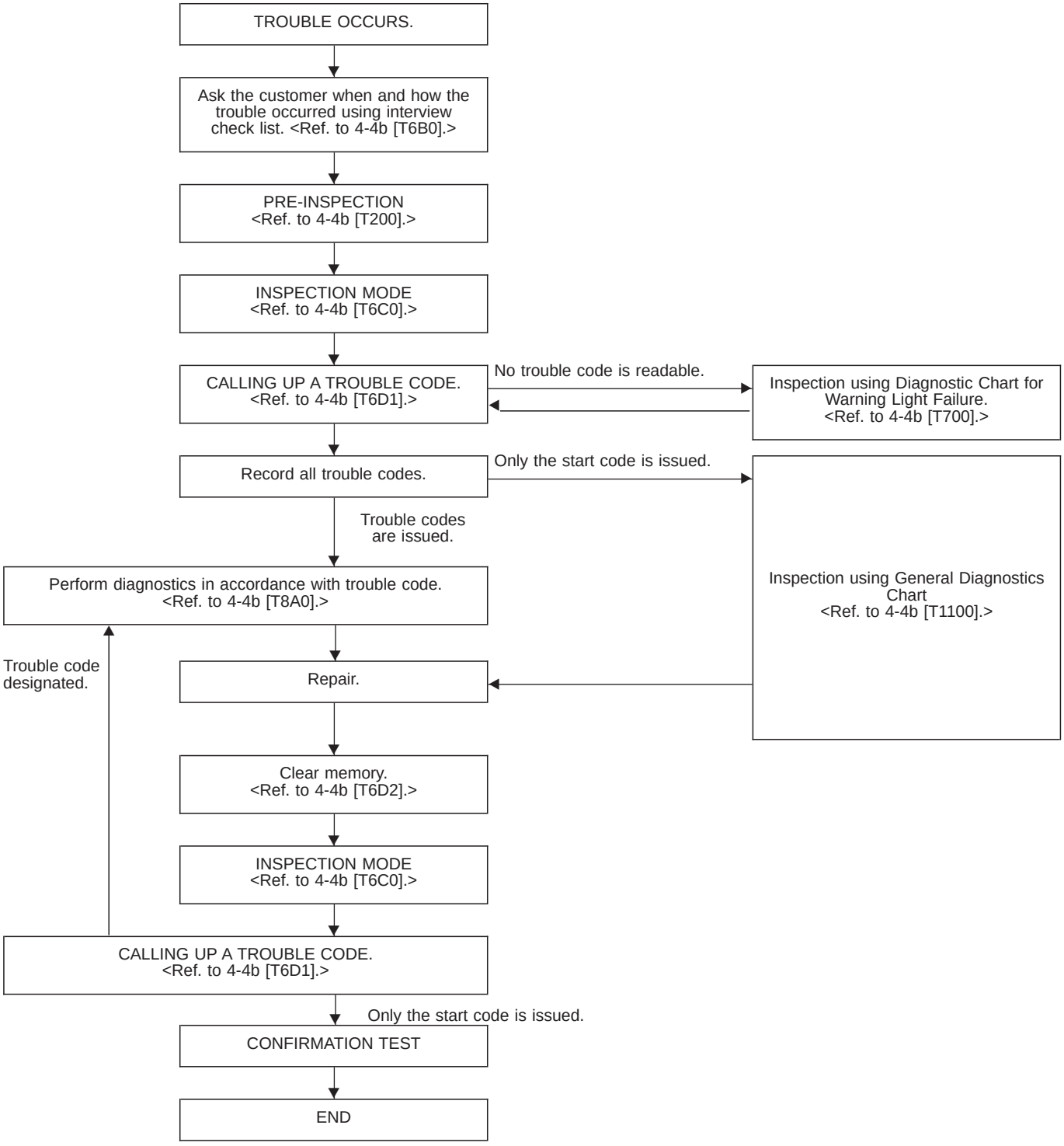
*: Except when trouble code is being displayed.

Trouble code	Diagnostic items <detailed diagnostic items>	Detection timing					Indicator light ON			Parts concerned
		At initial checking	Under no control	Under ABS control	Under TCS control	In diagnostic mode	ABS warning light	TCS warning light	TCS OFF indicator light	
43	Abnormal EGI communication line <Abnormal EGI communication line>	○	○	○			—	○	—	AET communication line (ABS/TCS C/M)
		○	○	○			—	○	—	
					○		—	○	—	
		○	○	○	○		—	○	—	AEB communication line (ABS/TCS C/M)
		○	○	○	○		—	○	—	
				○	○		—	○	—	
		○	○	○	○		—	○	—	AEC communication line (ABS/TCS C/M)
		○	○	○	○		—	○	—	
			○	○	○		—	○	—	
—	Abnormal EGI communication line <Abnormal EGI communication line>	○	○	○			—	—	○	EAM communication line (ABS/TCS C/M)
51	Abnormal valve relay <failure of valve relay ON> <failure of valve relay OFF>	○					○	○	—	Valve relay (ABS/TCS C/M)
	Abnormal valve relay <failure of valve relay OFF>	○	○	○	○		○	○	—	Valve relay (ABS/TCS C/M)
		○	○	○	○		○	○	—	
52	Abnormal motor system <failure of motor relay OFF>		○	○	○		○	○	—	Motor (ABS/TCS C/M)
	Abnormal motor system <failure of motor relay ON>		○	○			○	○	—	Motor (ABS/TCS C/M)
	Abnormal motor system <failure of motor relay OFF>		○				○	○	—	

Trouble code	Diagnostic items <detailed diagnostic items>	Detection timing					Indicator light ON			Parts concerned
		At initial checking	Under no control	Under ABS control	Under TCS control	In diagnostic mode	ABS warning light	TCS warning light	TCS OFF indicator light	
54	Abnormal pedal stroke sensor and stop light switch <open/short circuits of stroke sensor>	○	○	○			○	○	—	Pedal stroke sensor (ABS/TCS C/M)
	Abnormal pedal stroke sensor and stop light switch <comparison of acceleration and stroke sensor>		○				○	○	—	Pedal stroke sensor (ABS/TCS C/M)
	Abnormal pedal stroke sensor and stop light switch <comparison of stroke sensor and brake lamp switch>		○				○	○	—	Stop light switch, pedal stroke sensor (ABS/TCS C/M)
	Abnormal pedal stroke sensor and stop light switch <comparison of stroke sensor and pump exitation>			○			○	○	—	Pump, pedal stroke sensor (ABS/TCS C/M)
	Abnormal stroke sensor and stop light switch <open circuit of stop light switch>		○	○	○		—	○	—	Stop light switch circuit (ABS/TCS C/M)
57	Abnormal fluid level sensor <Abnormal fluid level sensor>	○					○	○	—	Fluid level sensor circuit
—	Abnormal fluid level sensor <Abnormal fluid level sensor> <Insufficient brake fluid>	○	○	○	○		○	○	—	Fluid level sensor circuit, reservoir
58	Abnormal pressure switch <Abnormal pressure switch>	○	○	○	○		—	○	—	Pressure switch (ABS/TCS C/M)
		○	○	○			—	○	—	Pressure switch, stop light switch (ABS/TCS C/M)
			○	○	○		—	○	—	Pressure switch (ABS/TCS C/M)

6. Diagnostics Chart for On-board Diagnosis System

A: BASIC DIAGNOSTICS PROCEDURE



NOTE:
- To check harness for broken wires or short circuits, shake it while holding it or the connector.
- When TCS warning light illuminates, read and record trouble code indicated by TCS warning light.

B: CHECK LIST FOR INTERVIEW

Check the following items about the vehicle's state.

1. THE STATE OF THE WARNING LIGHTS

a. ABS warning light	
① Is always on. ② Sometimes comes on. ③ Comes on only once. ④ Does not come on.	
When/how long does it come on?	
Ignition key position	① Lock ② Acc ③ On (before starting engine) ④ Start ⑤ On after starting (Engine: run) ⑥ On after starting (Engine: stop)
Timing	① Immediately after ignition is on. ② Immediately after ignition starts. ③ When advancing (Speed___miles/h →___miles/h) ④ While traveling at a constant speed (Speed___miles/h) ⑤ When decelerating (Speed___miles/h →___miles/h) ⑥ When turning (To right, to left, steering angle___deg., steering time___sec) ⑦ When other electrical parts move (Part name:_____, Operating condition_____) ⑧ When moving other electrical parts (Part name:_____, Operating condition_____)
b. TCS warning light	
① Is always on. ② Sometimes comes on. ③ Comes on only once. ④ Does not come on.	
When does it come on?	
Ignition key position	① Lock ② Acc ③ On (before starting engine) ④ Start ⑤ On after starting (Engine: run) ⑥ On after starting (Engine: stop)
Timing	① Immediately after ignition is on. ② Immediately after ignition starts. ③ When advancing (Speed___miles/h →___miles/h) ④ While traveling at a constant speed (Speed___miles/h) ⑤ When decelerating (Speed___miles/h →___miles/h) ⑥ When turning (To right, to left, steering angle___deg., steering time___sec) ⑦ When other electrical parts move (Part name:_____, Operating condition_____) ⑧ When moving other electrical parts (Part name:_____, Operating condition_____)
c. TCS OFF indicator light	
① Is always on. ② Sometimes comes on. ③ Comes on only once. ④ Does not come on.	
When/how long does it come on?	
Ignition key position	① Lock ② Acc ③ On (before starting engine) ④ Start ⑤ On after starting (Engine: run) ⑥ On after starting (Engine: stop)
Timing	① Immediately after ignition is on. ② Immediately after ignition starts. ③ When advancing (Speed___miles/h →___miles/h) ④ While traveling at a constant speed (Speed___miles/h) ⑤ When decelerating (Speed___miles/h →___miles/h) ⑥ When turning (To right, to left, steering angle___deg., steering time___sec) ⑦ When other electrical parts move (Part name:_____, Operating condition_____) ⑧ When moving other electrical parts (Part name:_____, Operating condition_____)
d. TCS operation indicator light	
① Is always on. ② Sometimes comes on. ③ Comes on only once. ④ Does not come on.	
When does it come on?	
Ignition key position	① Lock ② Acc ③ On (before starting engine) ④ Start ⑤ On after starting (Engine: run) ⑥ On after starting (Engine: stop)
Timing	① Immediately after ignition is on. ② Immediately after ignition starts. ③ When advancing (Speed___miles/h →___miles/h) ④ While traveling at a constant speed (Speed___miles/h) ⑤ When decelerating (Speed___miles/h →___miles/h) ⑥ When turning (To right, to left, steering angle___deg., steering time___sec) ⑦ When other electrical parts move (Part name:_____, Operating condition_____) ⑧ When moving other electrical parts (Part name:_____, Operating condition_____)

e. Malfunction indicator light	
① Is always on. ② Sometimes comes on. ③ Comes on only once. ④ Does not come on.	
When does it come on?	
Ignition key position	① Lock ② Acc ③ On (before starting engine) ④ Start ⑤ On after starting (Engine: run) ⑥ On after starting (Engine: stop)
Timing	① Immediately after ignition is on. ② Immediately after ignition starts. ③ When advancing (Speed___miles/h →___miles/h) ④ While traveling at a constant speed (Speed___miles/h) ⑤ When decelerating (Speed___miles/h →___miles/h) ⑥ When turning (To right, to left, steering angle___deg., steering time___sec) ⑦ When other electrical parts move (Part name:_____, Operating condition_____) ⑧ When moving other electrical parts (Part name:_____, Operating condition_____)

2. SYMPTOMS

ABS operating condition	① Performs no work. ② Operates only when abruptly applying brakes. (Conditions: vehicle speed___miles/h, how to step on brake pedal___) ③ Operating time (___sec., etc._____) ④ Operating noise (Produced/Not produced) ⑤ What kind of noise? (Knock, gong gong, bong, buzz, gong gong buzz, etc._____) ⑥ Reaction force of brake pedal (Stick, pressed down once with a clunk, pressed and released, etc._____)
TCS operating condition	① Performs no work. ② Operates only when abruptly accelerating. (Conditions: vehicle speed___miles/h, how to step on accelerator pedal_____) ③ Operating time (___sec., etc._____) ④ Operating noise (Produced/Not produced) ⑤ What kind of noise? (Knock, gong gong, bong, buzz, gong gong buzz, etc._____) ⑥ Whether or not operation indicator light comes on. (Come on/Does not come on, Others_____)
Behavior of vehicle	① Directional stability cannot be obtained or steering arm refuses to work when applying brakes (vehicle turns to right, turns to left, spins, etc._____). ② Directional stability cannot be obtained or steering arm refuses to work when accelerating (vehicle turns to right, turns to left, spins, etc._____). ③ Brakes are out of order (braking distance is long, brakes lock or drag, pedal stroke is long, pedal sticks, etc._____). ④ Poor acceleration (fails to accelerate, engine stalls, etc._____). ⑤ Vibration, abnormal noise (operating noise is loud, noise is produced during operation from the front of vehicle (right, left) (tones:____), noise is produced during operation from the rear of vehicle (tones:____, others_____) ⑥ Other phenomena (concrete symptoms_____)

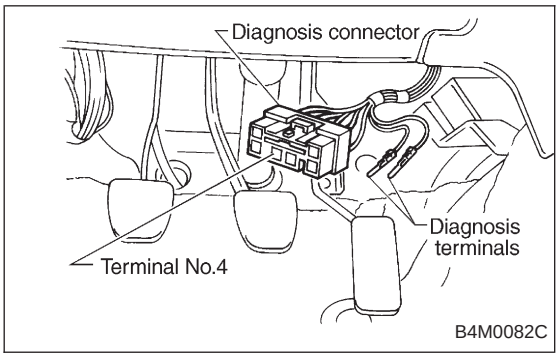
3. CONDITIONS UNDER WHICH TROUBLE OCCURS

Environment	① Weather (fine, cloudy, rain, snow, etc. ____) ② Ambient temperature (____°C/°F) ③ Road (urban area, suburbs, highway, general road, ascending slope, descending slope, paved road, gravel road, muddy road, sandy place, etc. ____) ④ Road surface (dry, wet, new-fallen snow, compressed snow, frozen slope, etc._____)
Conditions	① Brakes (deceleration___g, continuous/intermittent) ② Accelerator (acceleration___g, continuous/intermittent) ③ Travel speed (___miles, advancing, accelerating, reducing speed, low speed, turning, etc._____) ④ Condition of tire of each wheel (air pressure_____, degree of wear_____, whether or not genuine parts are used, whether or not chain is passed around tires, whether or not T tire is used.) others (_____) ⑤ Condition of suspension alignment (_____) ⑥ Loading state (_____)

4. REPAIRED PARTS ARE USED OR NOT

C: INSPECTION MODE

The on-board diagnosis system is designed to detect problems while the vehicle is being driven. If a problem is found, the ABS and TCS warning light will illuminate to inform the driver of the occurrence of a problem. When the warning light is on, the ABS/TCS system will be inactive and the normal braking function will work. It is possible for the most recent trouble code and history of problem to be stored in memory until cleared.



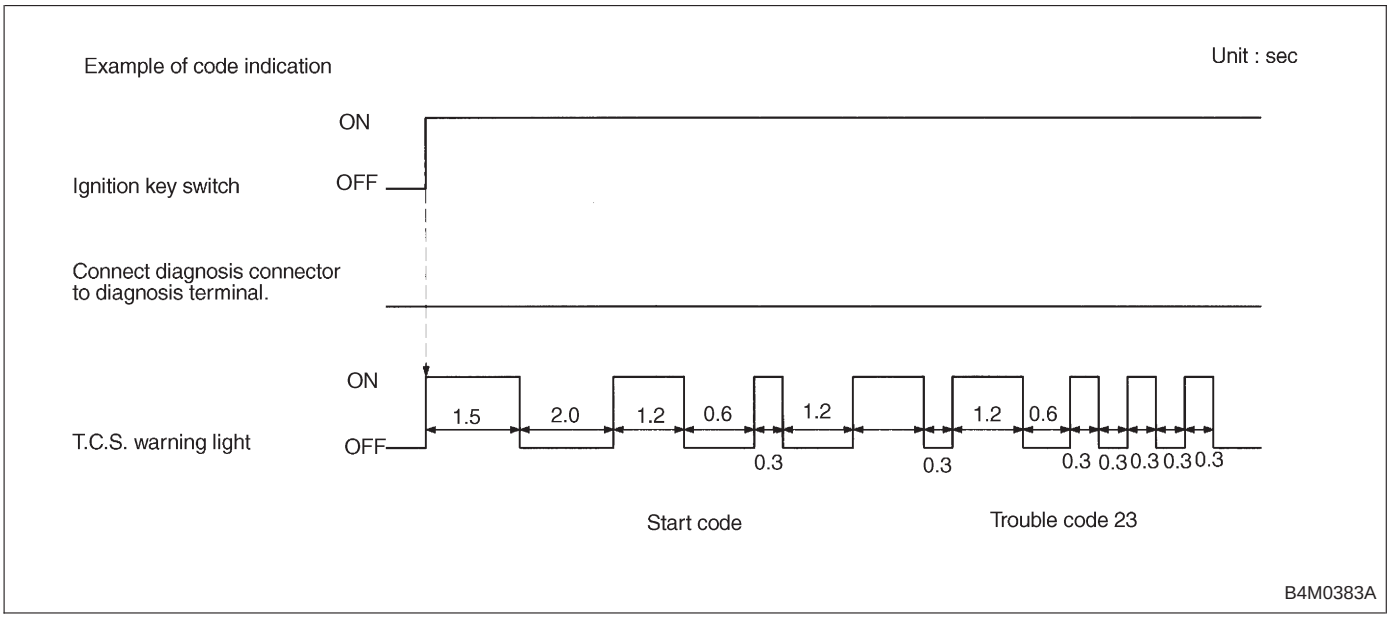
D: TROUBLE CODES

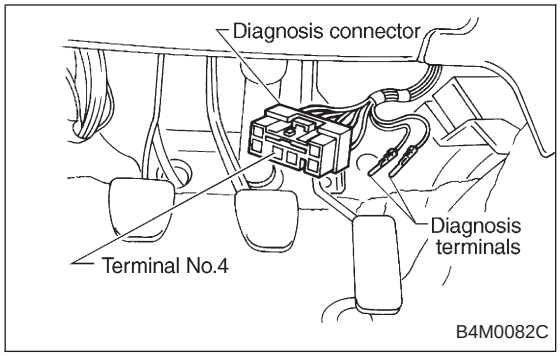
When on-board diagnosis of the ABS/TCS control module detects a problem, the information will be stored in the EEP ROM as a trouble code. (Stored codes will stay in memory until they are cleared.)

1. CALLING UP A TROUBLE CODE

1) Take out diagnosis connector from side of driver's seat heater unit.
2) Turn ignition switch OFF.
3) Connect diagnosis connector terminal No. 4 to diagnosis terminal.
4) Turn ignition switch ON.
5) TCS warning light is set in the diagnostic mode and blinks to identify trouble code.
6) After the start code (11) is shown, the trouble codes will be shown in order of the last information first.

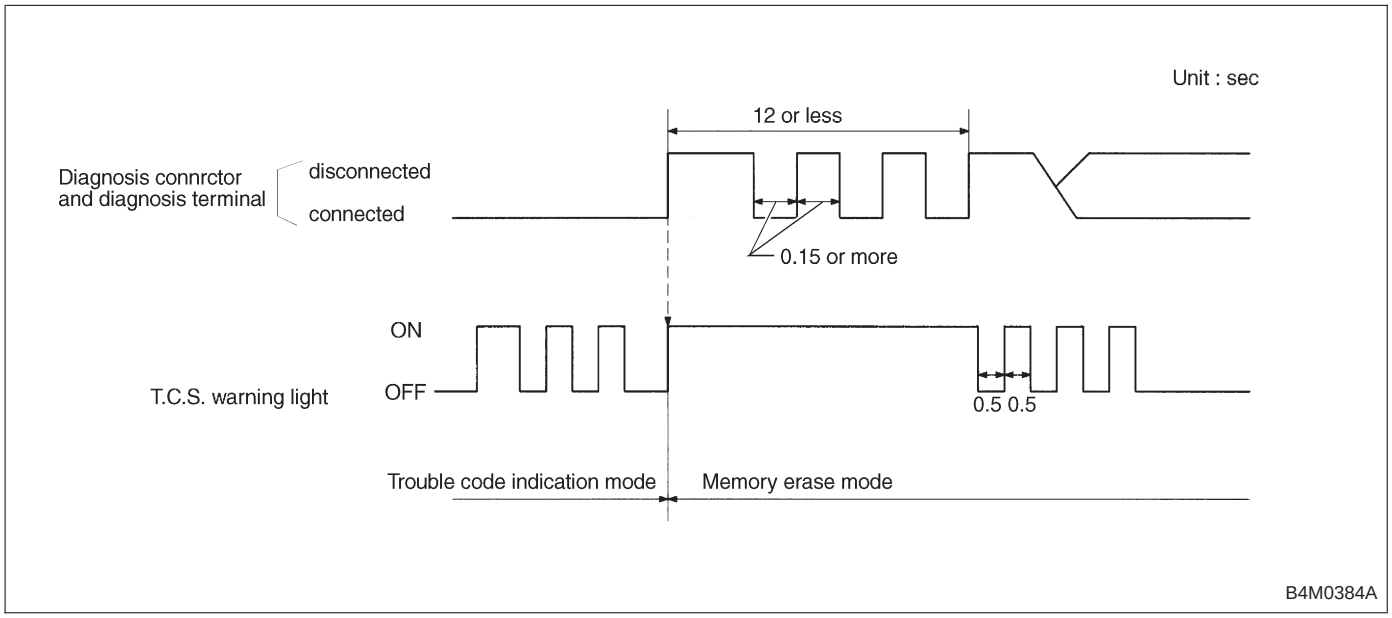
NOTE:
When there are no trouble codes in memory, only the start code (11) is shown.





2. CLEARING MEMORY

1) After calling up a trouble code, disconnect ABS check connector terminal No. 4 from diagnosis terminal.
2) Repeat 3 times within approx. 12 seconds; connecting and disconnecting terminal No. 4 and diagnosis terminal for at least 0.15 seconds each time.
3) Turn off the ignition key.



NOTE:
After diagnostics is completed, make sure to clear memory. Make sure only start code (11) is shown after memory is cleared.

7. Diagnostics Chart for Warning Light Circuit Failure

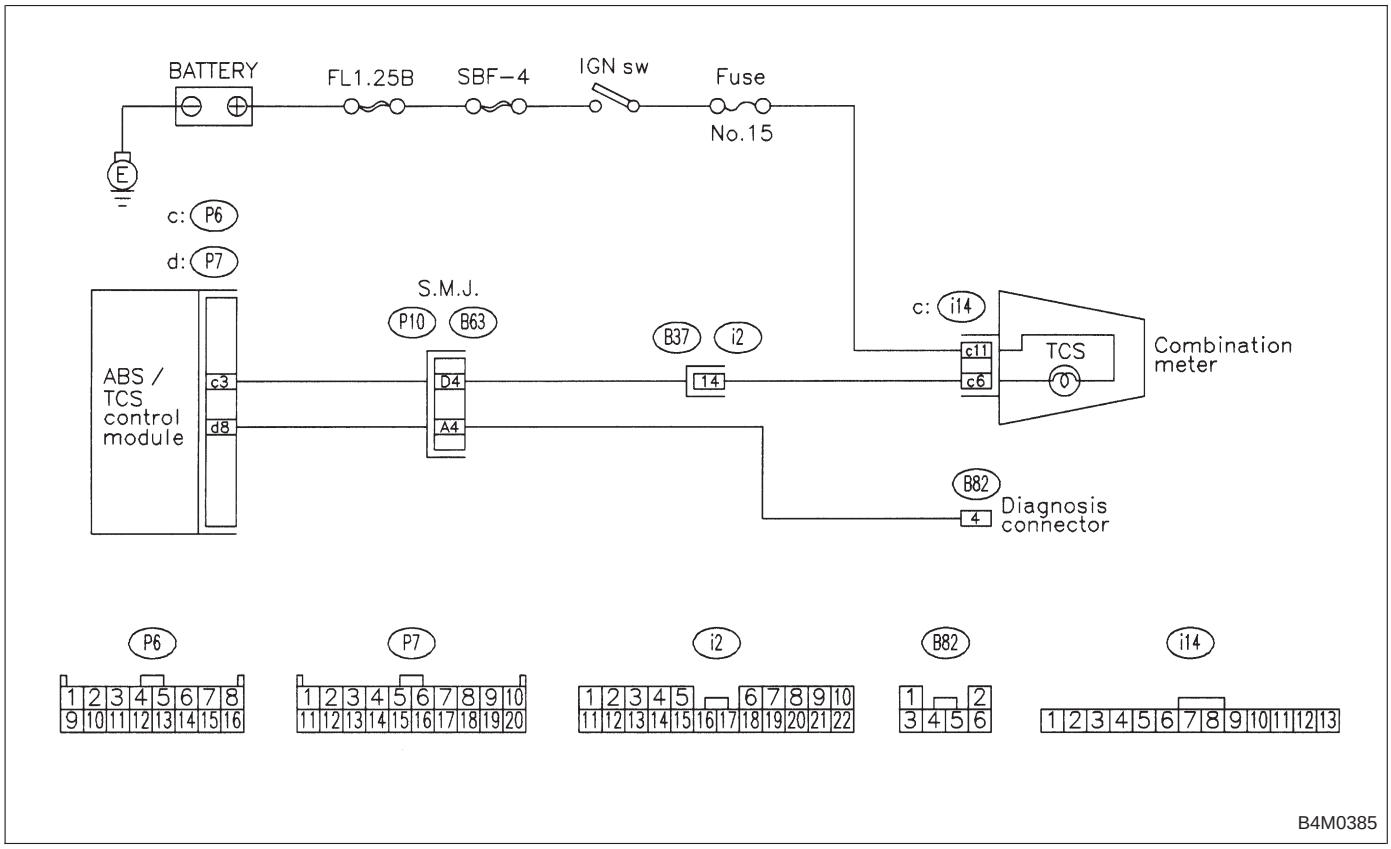
A: TROUBLE CODE DOES NOT APPEAR. — TCS WARNING LIGHT COMES ON WHEN STARTING THE ENGINE. —

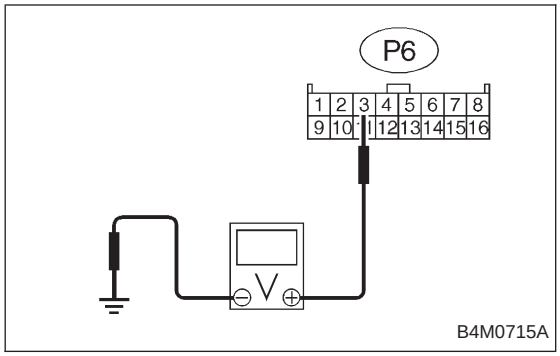
1. Check TCS warning light.
- Not OK → Repair harness.
- OK ↓

2. Check diagnosis terminal.
- Not OK → Repair harness.
- OK ↓

3. Check diagnosis connector.
- Not OK → Repair harness/connector.
- OK ↓

Replace ABS/TCS control module.

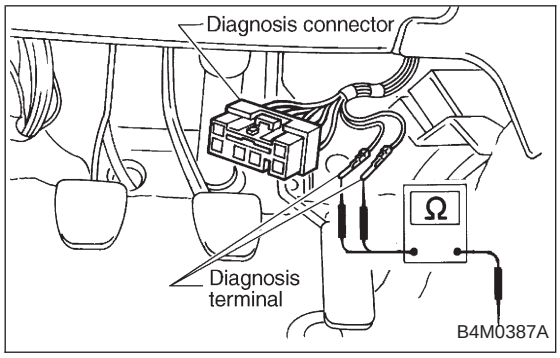




1. CHECK TCS WARNING LIGHT.

1) Turn ignition switch OFF.
2) Disconnect all connectors from ABS/TCS control module.
3) Turn ignition switch ON.
4) Measure voltage between ABS/TCS control module connector and body.

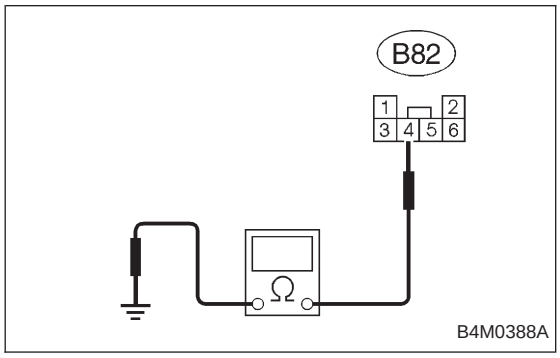
Connector & terminal / Specified voltage:
(P6) No. 3 — body / 10 — 14 V



2. CHECK DIAGNOSIS TERMINAL.

1) Turn ignition switch OFF.
2) Measure resistance between diagnosis terminal and body.

Connector/Specified resistance:
B81 — body / 0 Ω



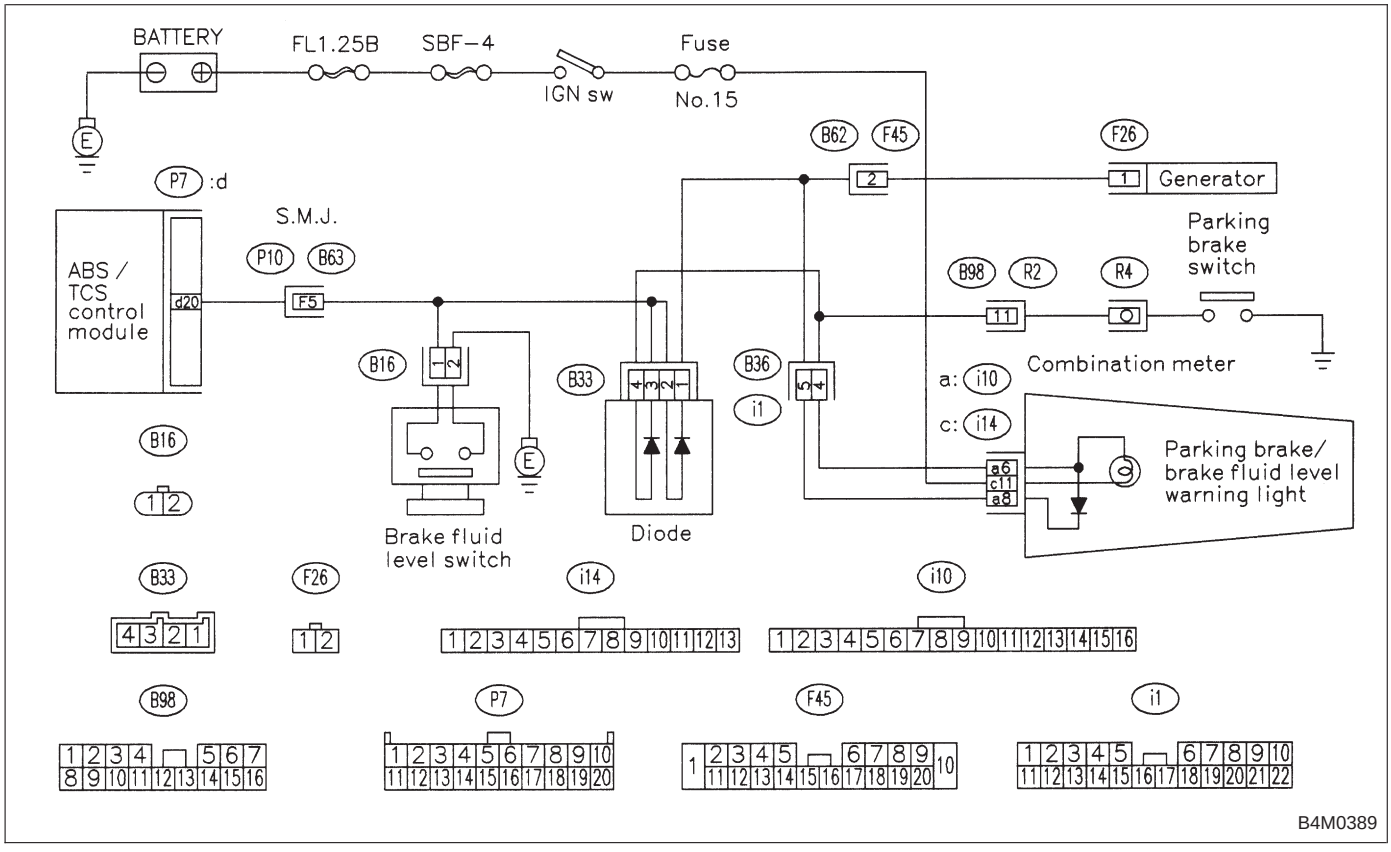
3. CHECK DIAGNOSIS CONNECTOR.

1) Turn ignition switch OFF.
2) Disconnect all connectors from ABS/TCS control module.
3) Measure resistance between diagnosis connector and body.

Connector & terminal / Specified resistance:
(B82) No. 4 — body / 0 Ω

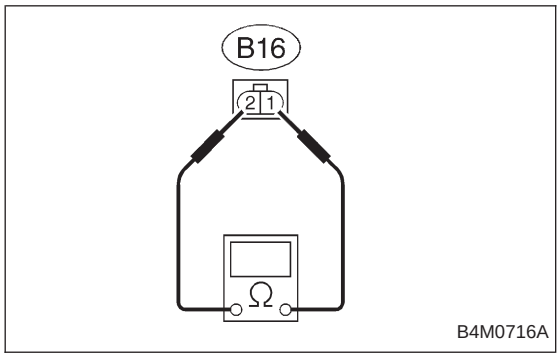
B: ABS AND TCS WARNING LIGHT DO NOT GO OFF.
— TCS OFF AND TCS OPERATING INDICATOR LIGHTS COME ON AND GO OFF PROPERLY WHEN STARTING THE ENGINE, WHILE ABS WARNING AND TCS WARNING LIGHTS KEEP ON. —

1. Check brake fluid level.	Not OK →	Add to brake fluid.
↓ OK		
2. Check brake fluid level sensor.	Not OK →	Replace master cylinder.
↓ OK		
3. Check harness connector between ABS/TCS control module and alternator.	Not OK →	Replace harness connector.
↓ OK		
Replace ABS/TCS control module.		



1. CHECK BRAKE FLUID LEVEL.

Check that brake fluid level is above the MIN indication on the reservoir tank.



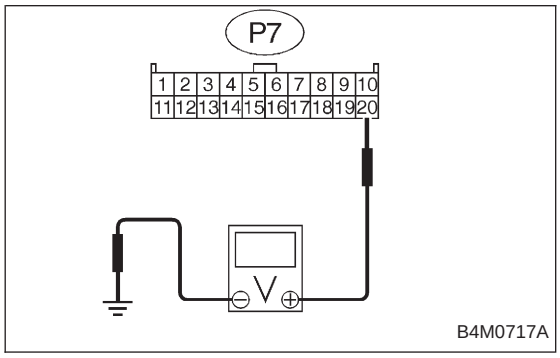
2. CHECK BRAKE FLUID LEVEL SENSOR.

1) Turn ignition switch OFF.
2) Disconnect connector from brake fluid level sensor.

Connector & terminal / Specified resistance:

(B16) No. 1 — No. 2 / 0 Ω (Leaving float where it is.)

(B16) No. 1 — No. 2 / 1 MΩ (When pushing float down.)



3. CHECK HARNESS CONNECTOR BETWEEN ABS/TCS CONTROL MODULE AND ALTERNATOR.

1) Turn ignition switch OFF.
2) Connect connector from brake fluid level sensor.
3) Disconnect all connectors from ABS/TCS control module.
4) Measure voltage between ABS/TCS control module connector and body.

Connector & terminal / Specified voltage:

(P7) No. 20 — body / 2 V or less

5) Start the engine.
6) Measure voltage between ABS/TCS control module connector and body.

Connector & terminal / Specified voltage:

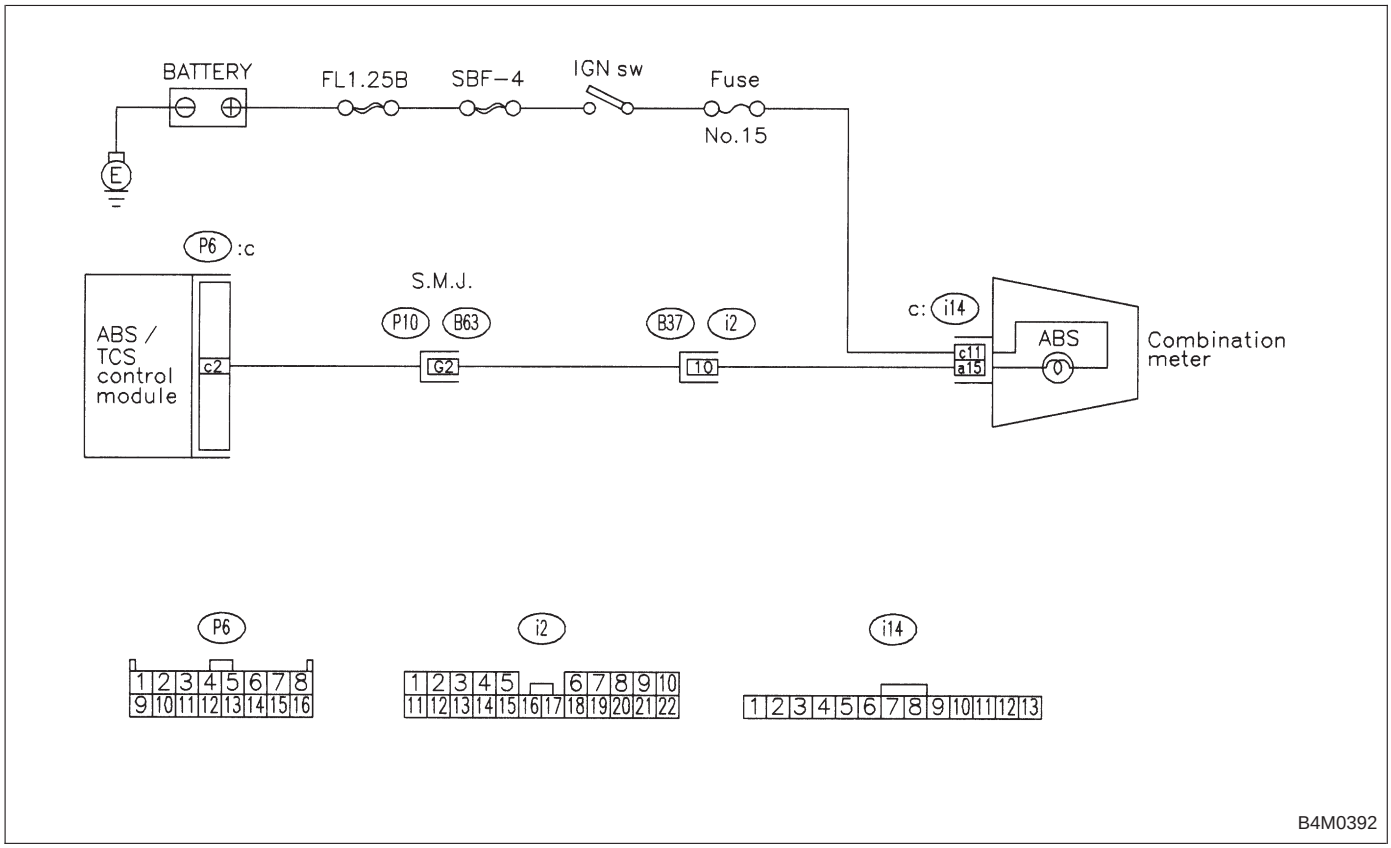
(P7) No. 20 — body / 10 — 14 V

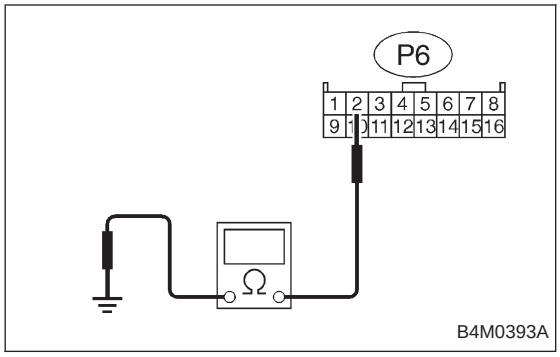
C: TCS WARNING LIGHT AND TCS INDICATOR OFF AND TCS OPERATING INDICATOR LIGHTS COME ON AND GO OFF PROPERLY, WHILE ABS WARNING LIGHT DOES NOT GO OFF.
— TCS WARNING LIGHT AND TCS OFF INDICATOR AND TCS OPERATING INDICATOR LIGHTS COME ON AND GO OFF PROPERLY WHEN STARTING THE ENGINE, WHILE ABS WARNING LIGHT DOES NOT GO OFF. —

1. Check harness connector between ABS/TCS control module and ABS warning light.

→ Repair harness connector.

↓ Replace ABS/TCS control module.





1. CHECK HARNESS CONNECTOR BETWEEN ABS/ TCS CONTROL MODULE AND ABS WARNING LIGHT.

1) Turn ignition switch OFF.
2) Disconnect connector from ABS/TCS control module and TCS valve relay.
3) Measure resistance between ABS/TCS control module connector and body.

Connector & terminal / Specified resistance:
(P6) No. 2 — body / 1 MΩ or more

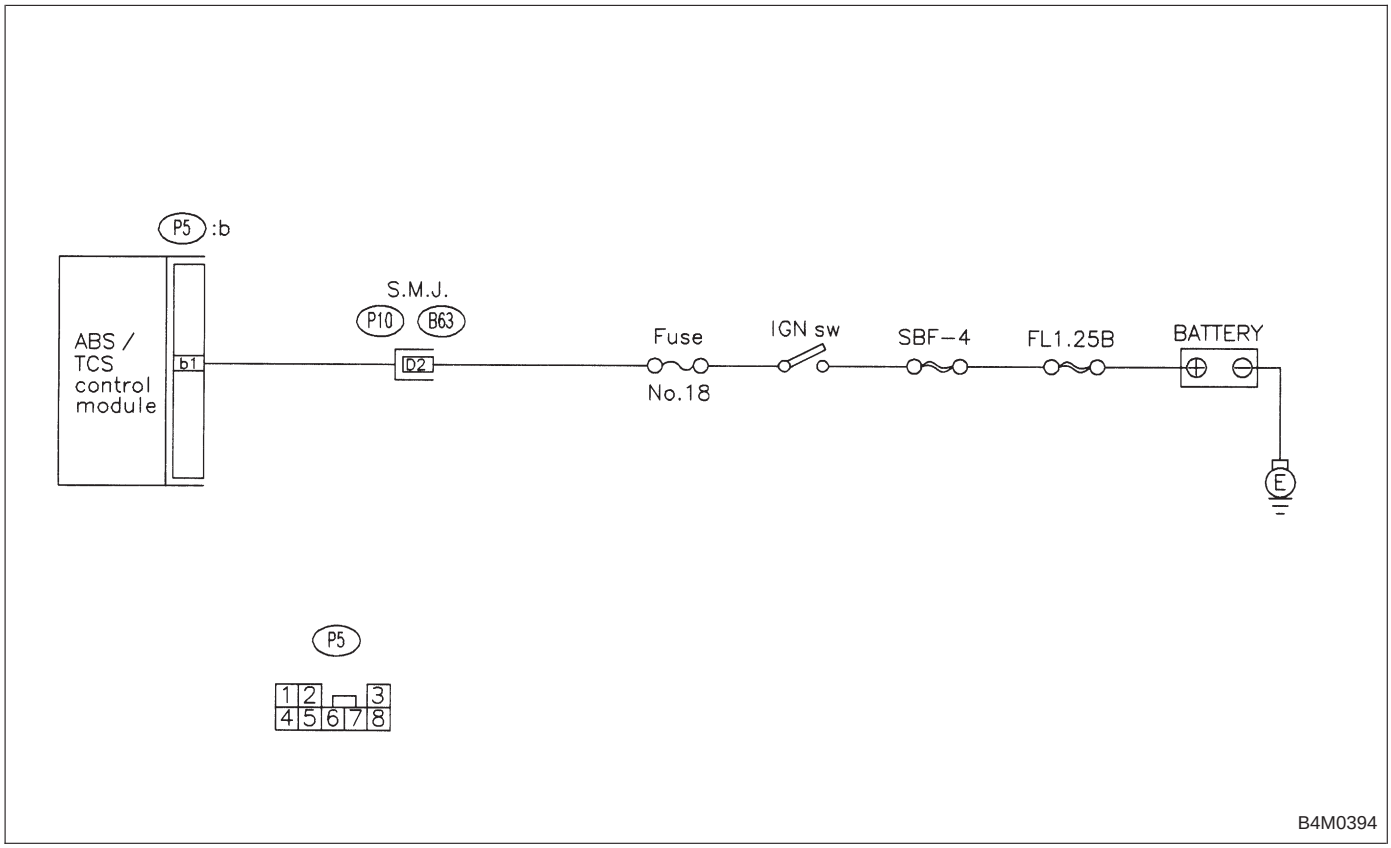
D: ABS WARNING LIGHT ONLY REMAINS ILLUMINATED.
— WHEN STARTING THE ENGINE, NEITHER TCS WARNING, TCS OFF INDICATOR NOR TCS OPERATING INDICATOR LIGHT COMES ON EVEN ONCE, AND ABS WARNING LIGHT AND MALFUNCTION INDICATOR LAMP ILLUMINATE. —

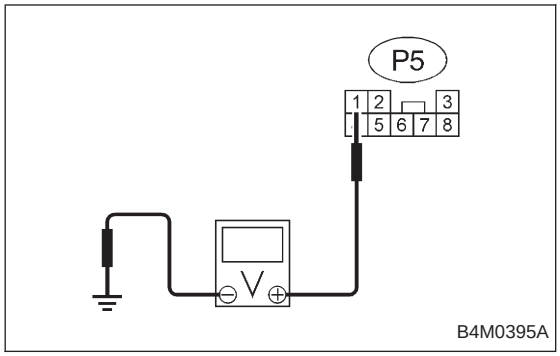
1. Check input voltage of ABS/TCS control module.

Not OK → Repair harness/connector.

OK ↓

Replace ABS/TCS control module.





1. CHECK INPUT VOLTAGE OF ABS/TCS CONTROL MODULE.

1) Turn ignition switch OFF.
2) Disconnect connector from ABS/TCS control module.
3) Turn ignition switch ON.
4) Measure voltage between ABS/TCS control module connector and body.

Connector & terminal / Specified voltage:
(P5) No. 1 — body / 10 — 13 V

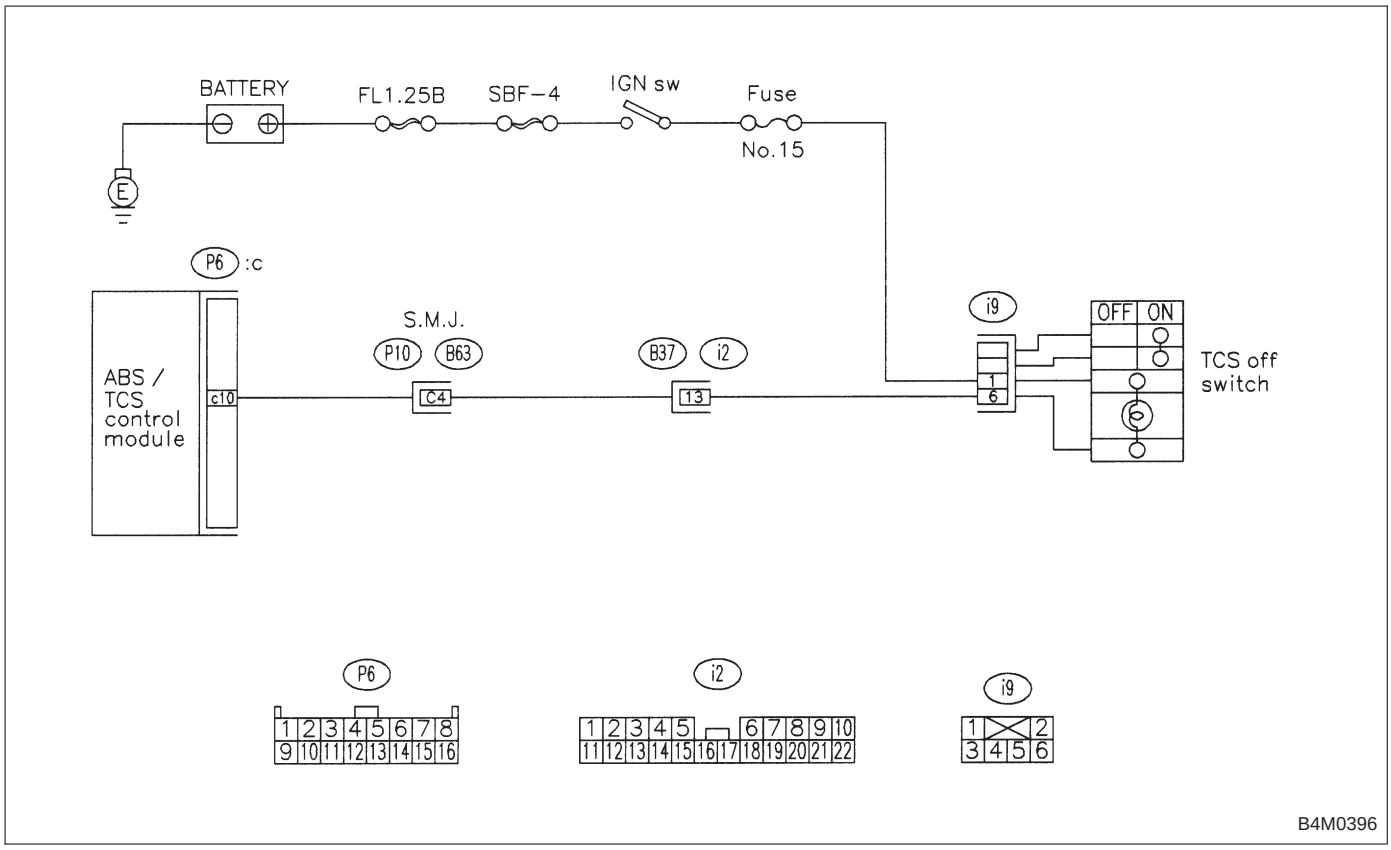
NOTE:
- When ABS/TCS control module is defective, the same condition occurs.
- Confirm that ABS/TCS control module is installed.

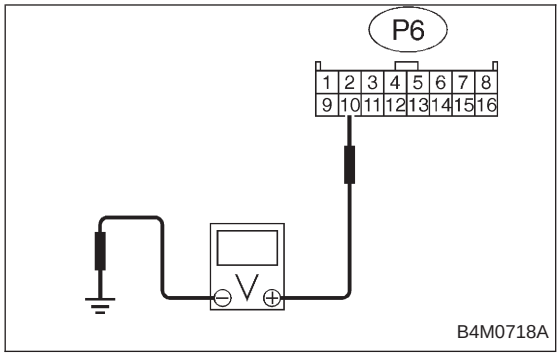
E: TCS OFF INDICATOR LIGHT DOES NOT GO OFF.
— ABS WARNING, TCS WARNING AND TCS OPERATING INDICATOR LIGHTS COME ON AND GO OFF PROPERLY WHEN STARTING THE ENGINE, BUT TCS OFF INDICATOR DOES NOT GO OFF FOR MORE THAN 30 SECONDS AFTER ENGINE RUNNING. —

Does malfunction indicator lamp (Check engine lamp) come on?
- Yes → Conduct OBD II diagnosis. <Ref. to 2-7 [T11A0].>
- No ↓

1. Check harness connector between ABS/TCS control module and TCS OFF indicator light.
- Not OK → Repair harness/connector.
- OK ↓

Replace ABS/TCS control module.





1. CHECK HARNESS CONNECTOR BETWEEN ABS/TCS CONTROL MODULE AND TCS OFF INDICATOR LIGHT.

1) Turn ignition switch OFF.
2) Disconnect all connectors from ABS/TCS control module.
3) Turn ignition switch ON.
4) Measure voltage between ABS/TCS control module connector and body.

Connector & terminal / Specified voltage:
(P6) No. 10 — body / 10 — 13 V

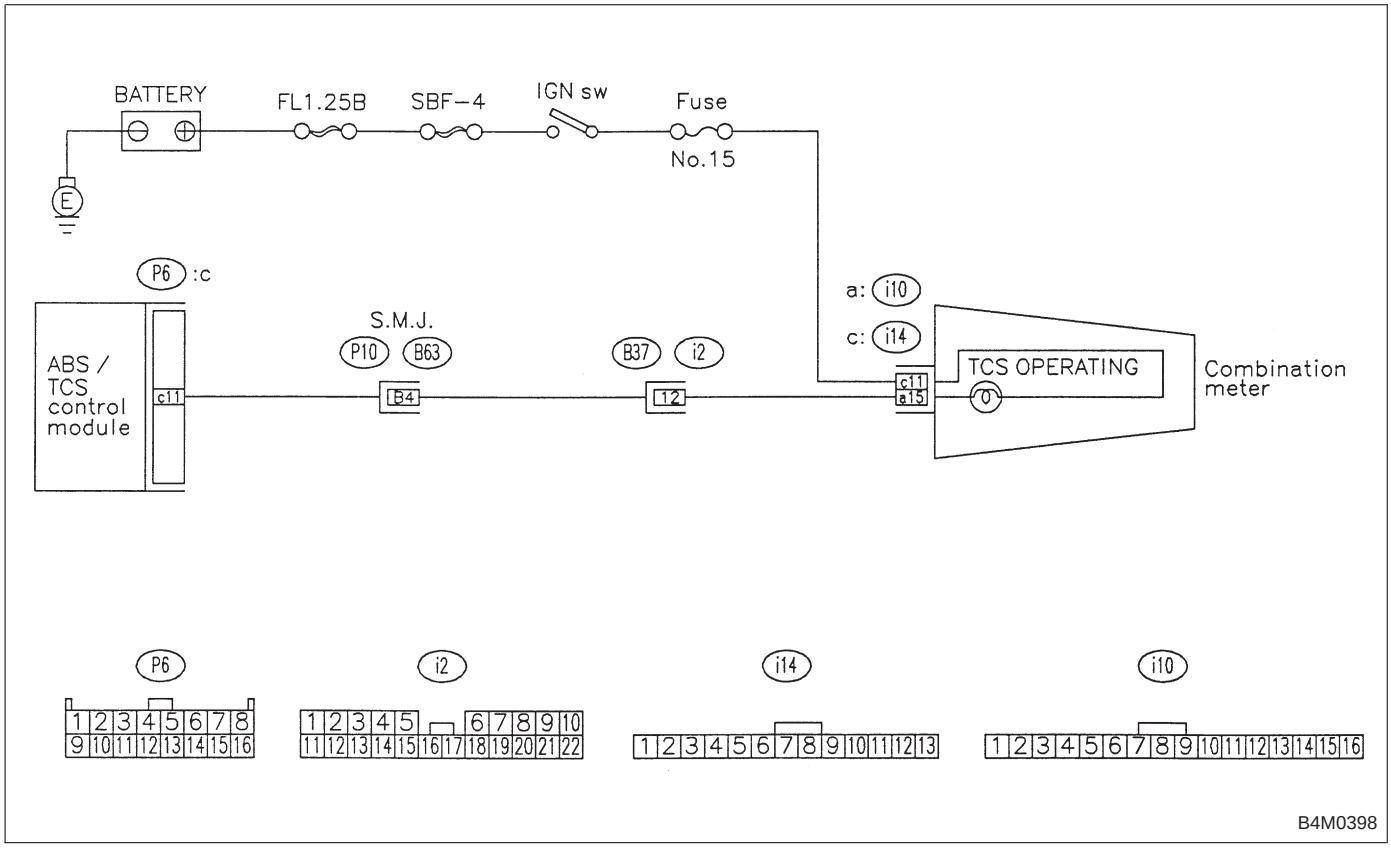
F: TCS OPERATING INDICATOR LIGHT DOES NOT GO OFF.
— WHEN STARTING THE ENGINE, ABS WARNING, TCS WARNING AND TCS OFF INDICATOR LIGHTS COME ON AND GO OFF PROPERLY BUT TCS OPERATING INDICATOR LIGHT ONLY KEEPS ON. —

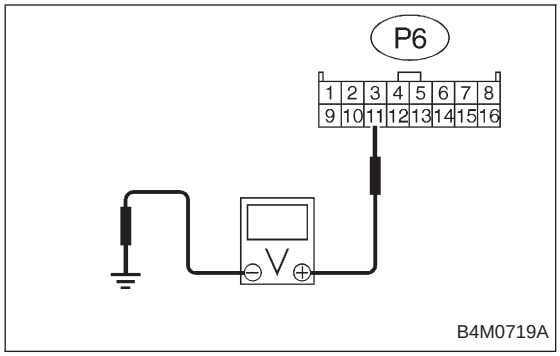
1. Check harness connector between ABS/TCS control module and TCS operating indicator light.

Not OK → Repair harness/connector.

OK ↓

Replace ABS/TCS control module.





1. CHECK HARNESS CONNECTOR BETWEEN ABS/TCS CONTROL MODULE AND TCS OPERATING INDICATOR LIGHT.

1) Turn ignition switch OFF.
2) Disconnect all connectors from ABS/TCS control module.
3) Turn ignition switch ON.
4) Measure voltage between ABS/TCS control module connector and body.

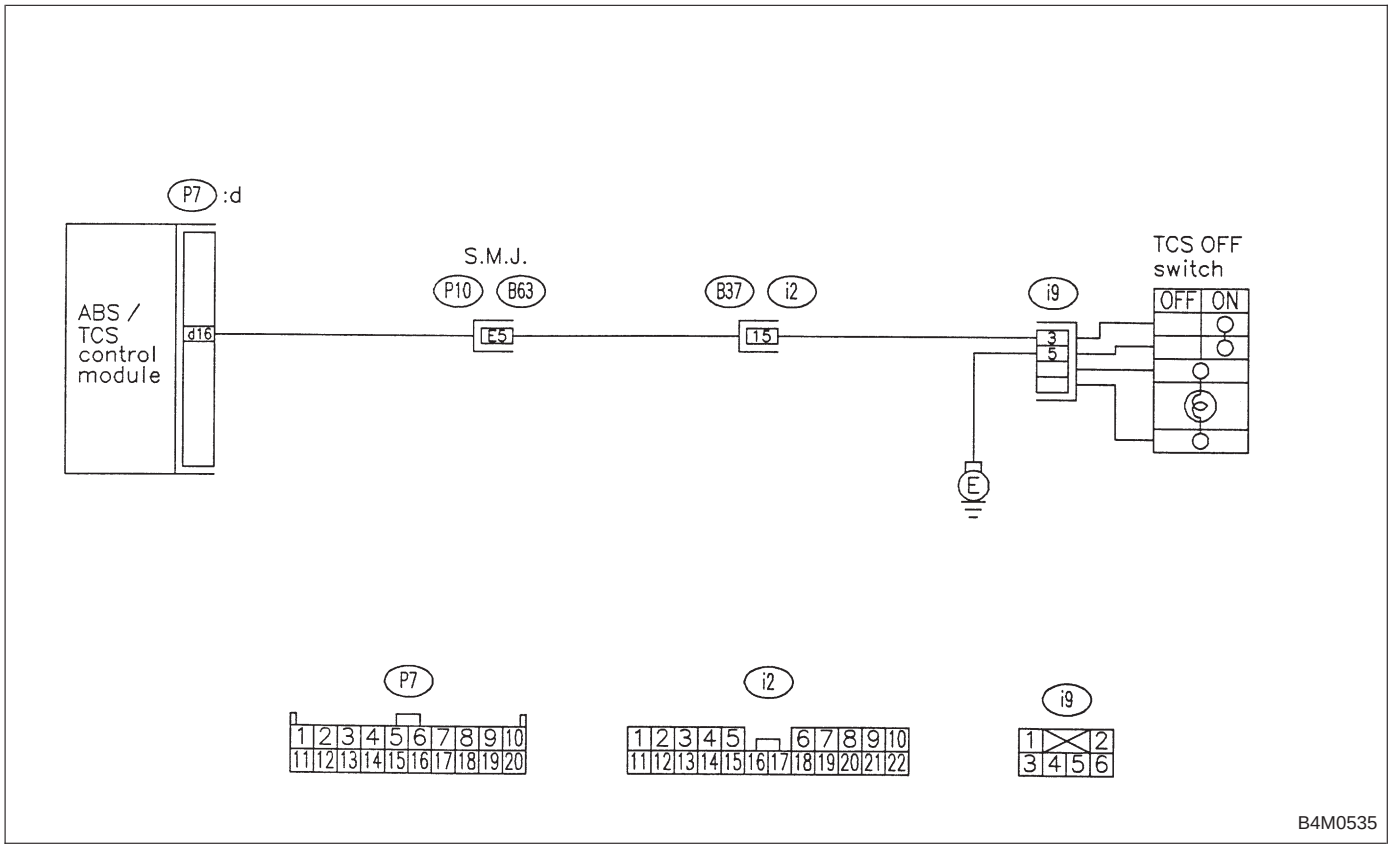
Connector & terminal / Specified voltage:
(P6) No. 11 — body / 10 — 13 V

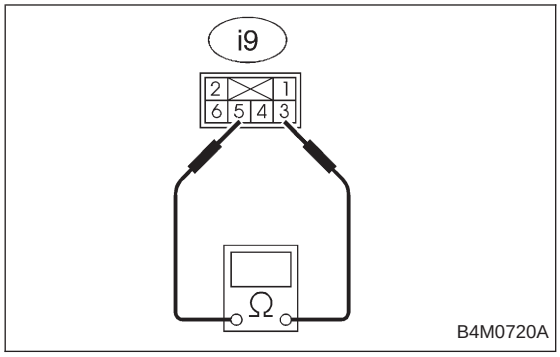
G: TCS OFF SWITCH DOES NOT FUNCTION. — TCS OFF INDICATOR LIGHT COMES ON AND GOES OFF PROPERLY WHEN STARTING THE ENGINE, WHILE THIS LIGHT NEITHER COMES ON NOR GOES OFF WHEN PUSHING THE TCS OFF SWITCH. —

1. Check TCS OFF switch
- Not OK → Replace TCS OFF switch.
- OK ↓

2. Check harness connector between ABS/TCS control module and TCS OFF switch.
- Not OK → Repair harness/connector.
- OK ↓

Replace ABS/TCS control module.

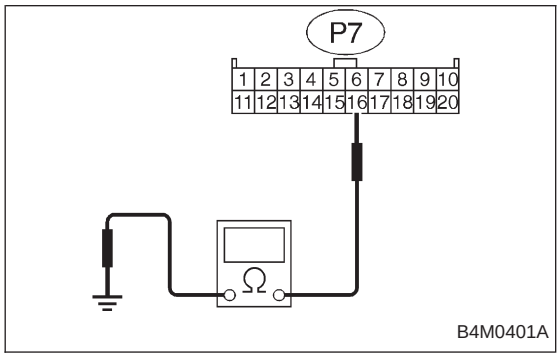




1. CHECK TCS OFF SWITCH.

1) Turn ignition switch OFF.
2) Disconnect connector from TCS OFF switch.
3) Measure resistance between TCS OFF switch terminals.

Connector & terminal / Specified resistance:
(i9) No. 5 — No. 3 / 1 Ω or less (When the switch is pressed, turns ON.) / 1 MΩ or less (When the switch is released, turns OFF.)



2. CHECK HARNESS CONNECTOR BETWEEN ABS/TCS CONTROL MODULE AND TCS OFF SWITCH.

1) Turn ignition switch OFF.
2) Disconnect connector to TCS OFF switch.
3) Disconnect connector from ABS/TCS control module.
4) Measure resistance between ABS/TCS control module connector terminals.

Connector & terminal / Specified resistance:
(P7) No. 16 — body / 1 Ω or less (When the switch is pressed, turns ON.) / 1 MΩ or more (When the switch is released, turns OFF.)

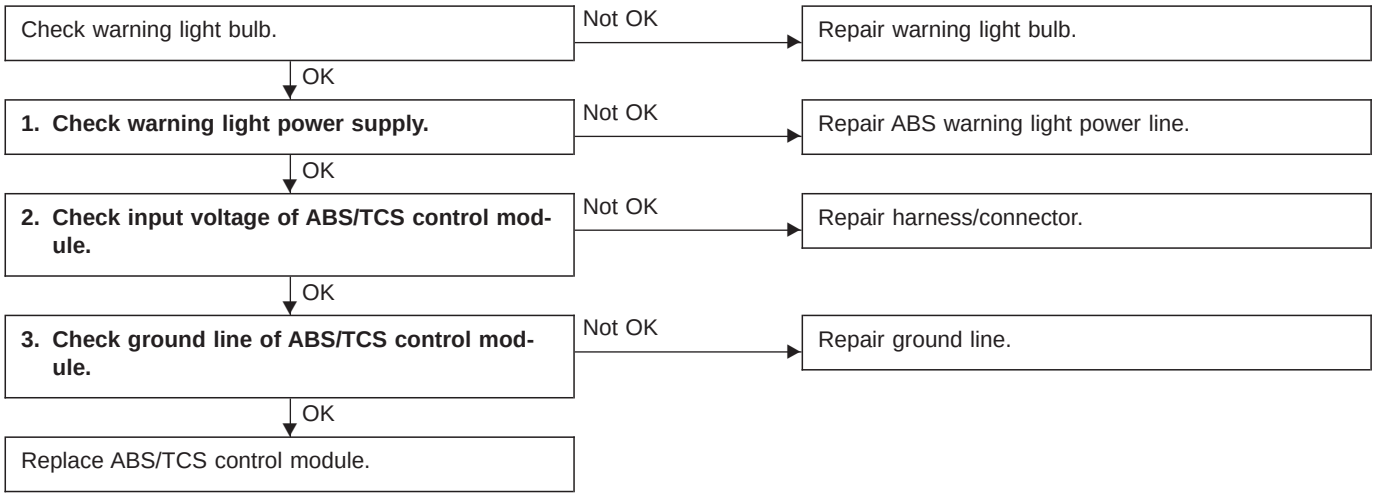
H: ABS WARNING, TCS WARNING, TCS OPERATING INDICATOR AND/OR TCS OFF INDICATOR LIGHTS DO NOT COME ON. — TROUBLE IN WARNING LIGHT DRIVE CIRCUIT —

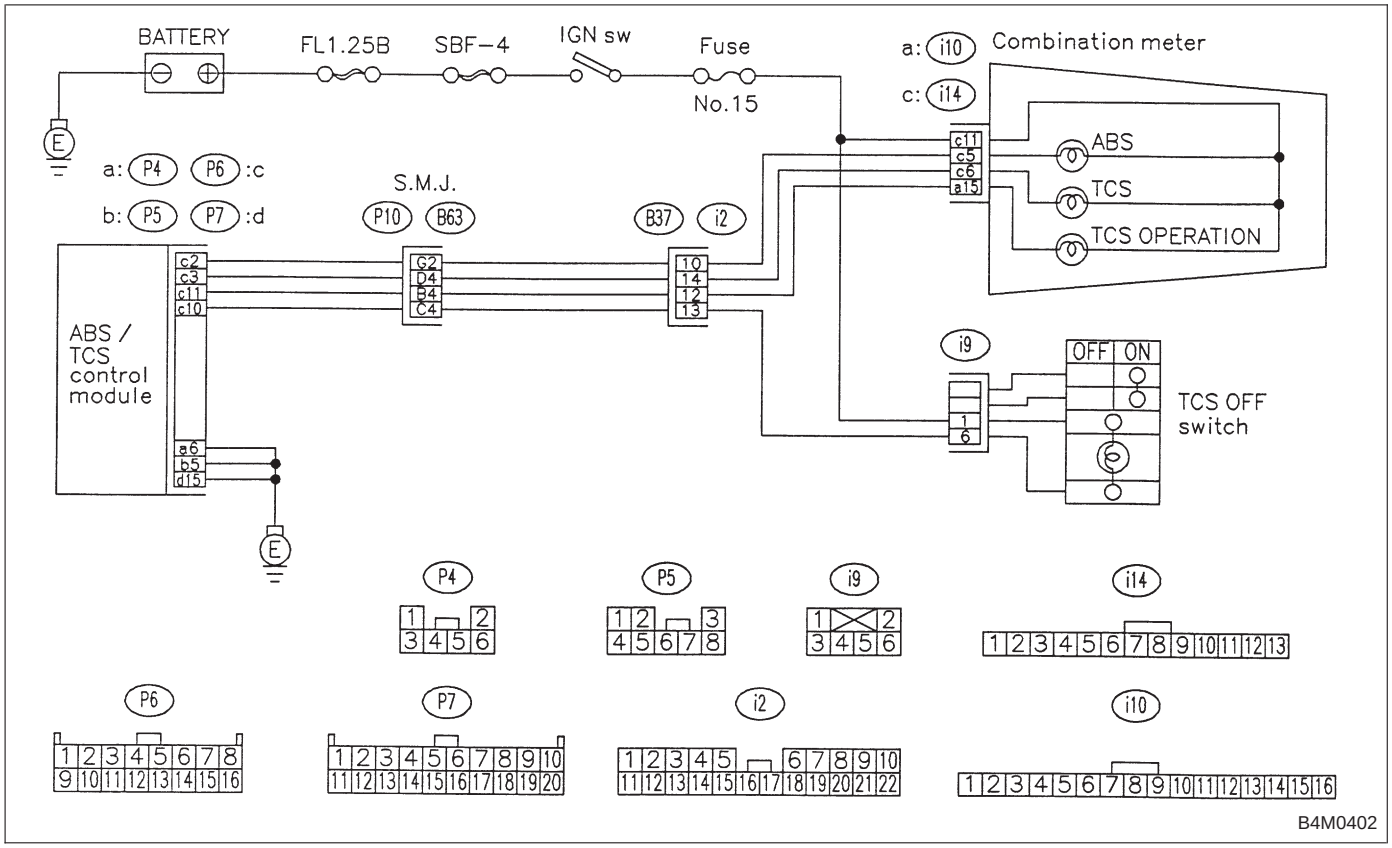
DIAGNOSIS:

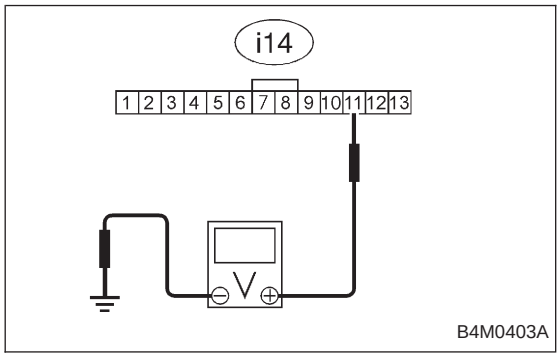
- Faulty ABS warning light
- Faulty TCS warning light
- Faulty TCS OFF light
- Faulty TCS operating indicator light
- Faulty harness connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- Warning light does not illuminate.
- Impossible to read trouble code.



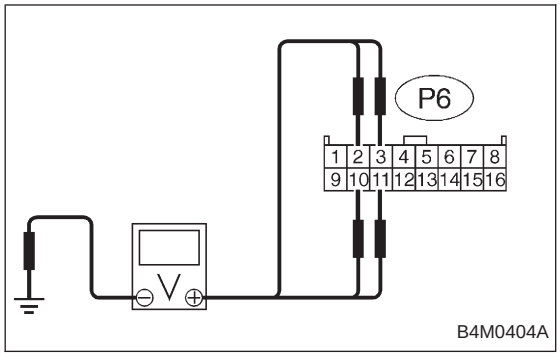




1. CHECK WARNING LIGHT POWER SUPPLY.

1) Turn ignition switch OFF.
2) Disconnect combination meter.
3) Turn ignition switch ON.
4) Measure voltage between combination meter connector and body.

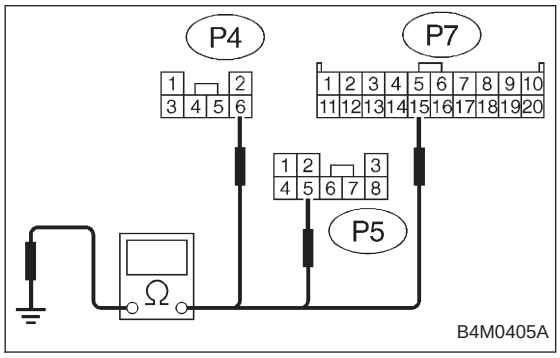
Connector & terminal / Specified voltage:
(i14) No. 11 — body / 10 — 13 V



2. CHECK INPUT VOLTAGE OF ABS/TCS CONTROL MODULE.

1) Turn ignition switch OFF and connect combination meter connector.
2) Disconnect all connectors from ABS/TCS control module.
3) Remove ABS/TCS valve relay.
4) Turn ignition switch ON.
5) Measure voltage between ABS/TCS control module and body.

Connector & terminal / Specified voltage:
ABS warning:
(P6) No. 2 — body / 10 — 13 V
TCS warning:
(P6) No. 3 — body / 10 — 13 V
TCS operation:
(P6) No. 11 — body / 10 — 13 V
TCS OFF:
(P6) No. 10 — body / 10 — 13 V



3. CHECK GROUND LINE OF ABS/TCS CONTROL MODULE.

Measure resistance between ABS/TCS control module and body.

Connector & terminal / Specified resistance:
(P4) No. 6 — body / 1 Ω or less
(P5) No. 5 — body / 1 Ω or less
(P7) No. 15 — body / 1 Ω or less

8. Diagnostics Chart with Trouble Code

A: LIST OF TROUBLE CODE

Trouble code	Contents of diagnosis		Ref. to 4-4b
11	Start code ● Trouble code is shown after start code. ● Only start code is shown in normal condition.		—
21	Faulty ABS sensor (Open circuit or short circuit)	Front right wheel speed sensor	[T8B0]
23		Front left wheel speed sensor	
25		Rear right wheel speed sensor	
27		Rear left wheel speed sensor	
22	Faulty ABS sensor (Faulty ABS sensor signal)	Front right wheel speed sensor	[T8C0]
24		Front left wheel speed sensor	
26		Rear right wheel speed sensor	
28		Rear left wheel speed sensor	
31	Faulty solenoid valve circuit(s) in hydraulic unit	Front right inlet valve	[T8D0]
32		Front right outlet valve	[T8E0]
33		Front left inlet valve	[T8D0]
34		Front left outlet valve	[T8E0]
35		Rear right inlet valve	[T8D0]
36		Rear right outlet valve	[T8E0]
37		Rear left inlet valve	[T8D0]
38		Rear left outlet valve	[T8E0]
41	Faulty ABS/TCS control module		[T8F0]
42	Source voltage is high.		[T8G0]
43	Faulty engine control module communication cables		[T8H0]
51	Faulty valve relay		[T8I0]
52	Faulty motor, motor sensor and/or motor relay		[T8J0]
54	Faulty stroke sensor and/or stop light switch		[T8K0]
57	Faulty fluid level sensor		[T8L0]
58	Faulty pressure switch		[T8M0]
61	Faulty solenoid valve circuit(s) in hydraulic unit	TCS 1 valve	[T8D0]
62		TCS 2 valve	[T8D0]

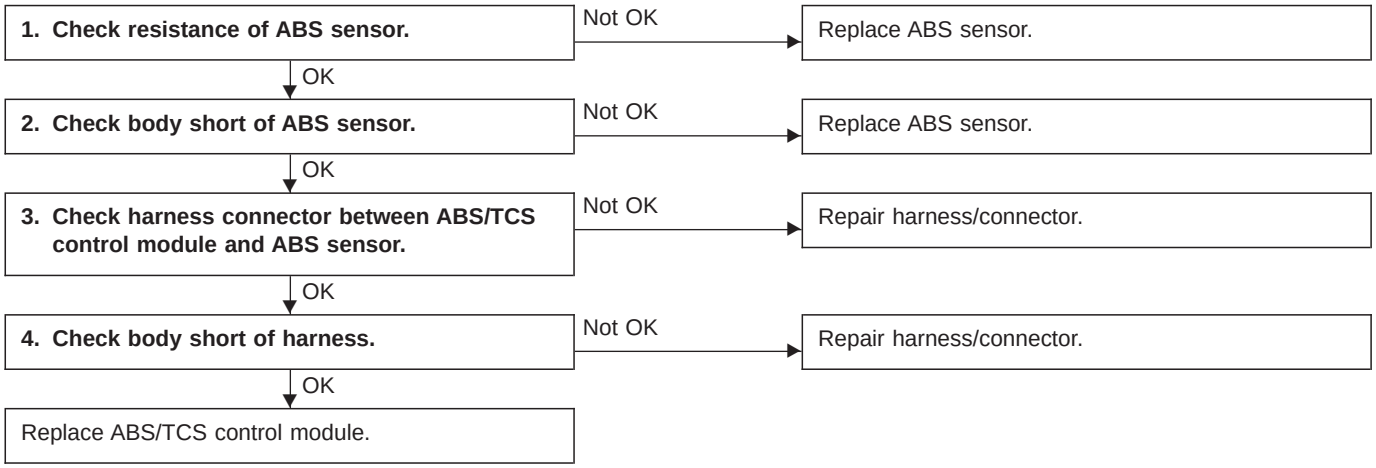
B: TROUBLE CODE 21, 23, 25 AND 27 — FAULTY ABS SENSOR (OPEN CIRCUIT OR SHORT CIRCUIT) —

DIAGNOSIS:

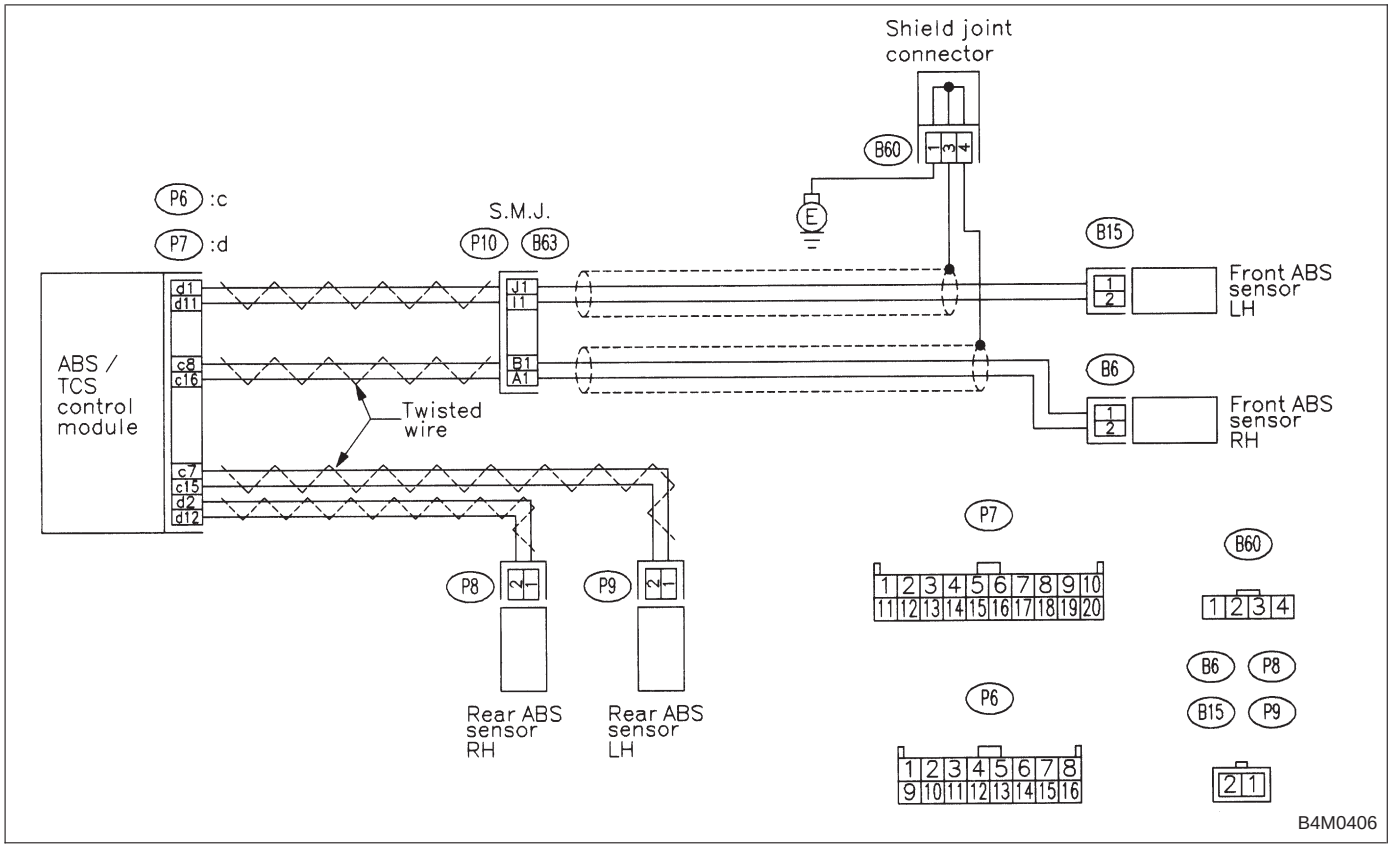
- Faulty ABS sensor
- Faulty harness/connector
- Faulty ABS/TCS control module

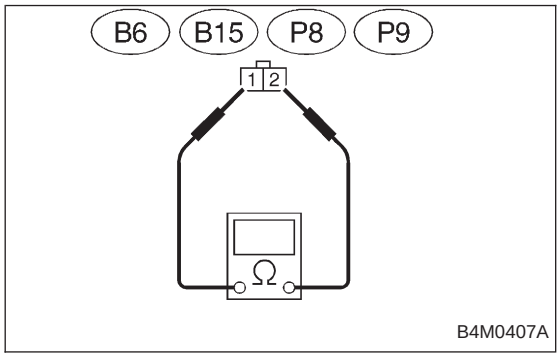
TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.



NOTE:
When checking ABS sensor, carefully bend or swing connector and harness to check for improper contacts or open circuits.



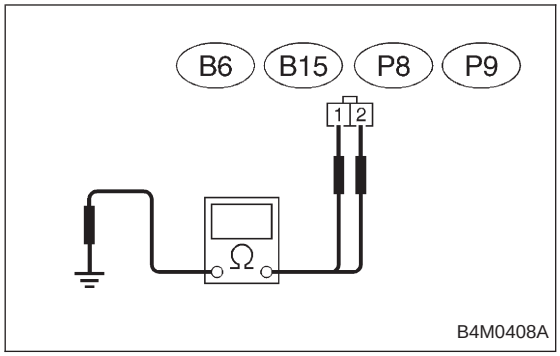


1. CHECK RESISTANCE OF ABS SENSOR.

1) Turn ignition switch OFF.
2) Disconnect connector from ABS sensor.
3) Measure resistance between ABS sensor connector terminals.

TROUBLE CODE / Connector & terminal:

21 / (B6) No. 1 — No. 2
23 / (B15) No. 1 — No. 2
25 / (P8) No. 1 — No. 2
27 / (P9) No. 1 — No. 2
Specified resistance: 0.8 — 1.2 kΩ

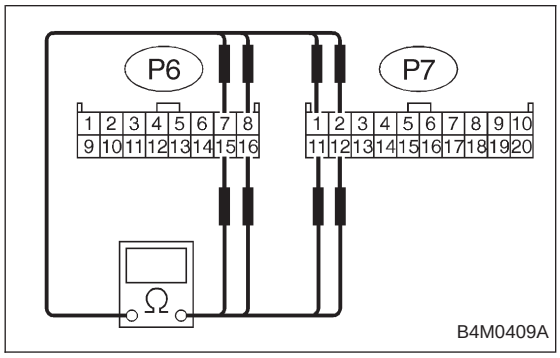


2. CHECK BODY SHORT OF ABS SENSOR.

1) Turn ignition switch OFF.
2) Disconnect connector from ABS sensor.
3) Measure resistance between ABS sensor connector terminal and body.

TROUBLE CODE / Connector & terminal:

21 / (B6) No. 1 — body
/ (B6) No. 2 — body
23 / (B15) No. 1 — body
/ (B15) No. 2 — body
25 / (P8) No. 1 — body
/ (P8) No. 2 — body
27 / (P9) No. 1 — body
/ (P9) No. 2 — body
Specified resistance: 1 MΩ or more

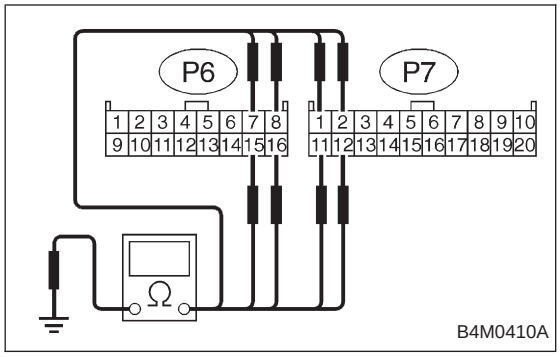


3. CHECK HARNESS CONNECTOR BETWEEN ABS/ TCS CONTROL MODULE AND ABS SENSOR.

1) Turn ignition switch OFF.
2) Connect connector to ABS sensor.
3) Disconnect all connectors from ABS/TCS control module.
4) Measure resistance between ABS/TCS control module connector terminals.

TROUBLE CODE / Connector & terminal:

21 / (P6) No. 8 — No. 16
23 / (P7) No. 1 — No. 11
25 / (P7) No. 2 — No. 12
27 / (P6) No. 7 — No. 15
Specified resistance: 0.8 — 1.2 kΩ



4. CHECK BODY SHORT OF HARNESS.

1) Turn ignition switch OFF.
2) Connect connector to ABS sensor.
3) Disconnect all connectors from ABS/TCS control module.
4) Measure resistance between ABS/TCS control module connector terminals.

TROUBLE CODE / Connector & terminal:

21 / (P6) No. 8 — body
/ (P6) No. 16 — body
23 / (P7) No. 1 — body
/ (P7) No. 11 — body
25 / (P7) No. 2 — body
/ (P7) No. 12 — body
27 / (P6) No. 7 — body
/ (P6) No. 15 — body
Specified resistance: 1 MΩ or more

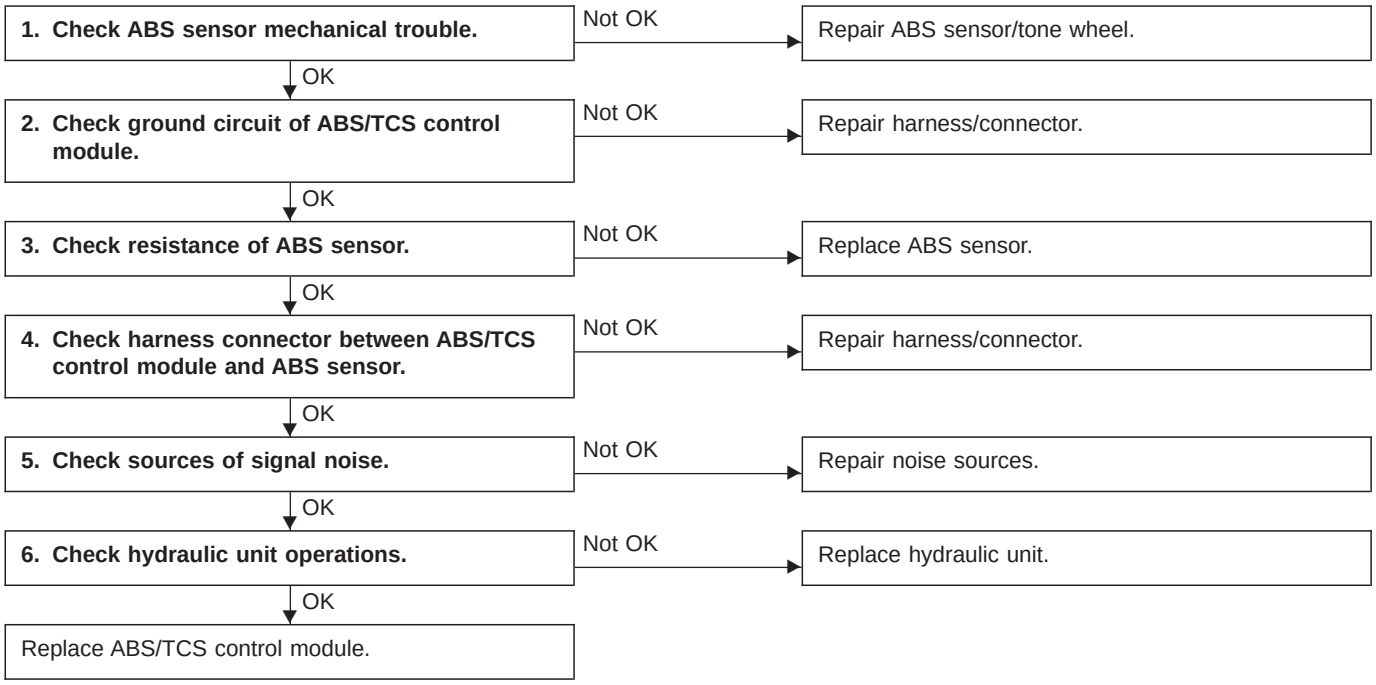
C: TROUBLE CODE 22, 24, 26 AND 28 — FAULTY ABS SENSOR (FAULTY ABS SENSOR SIGNAL) —

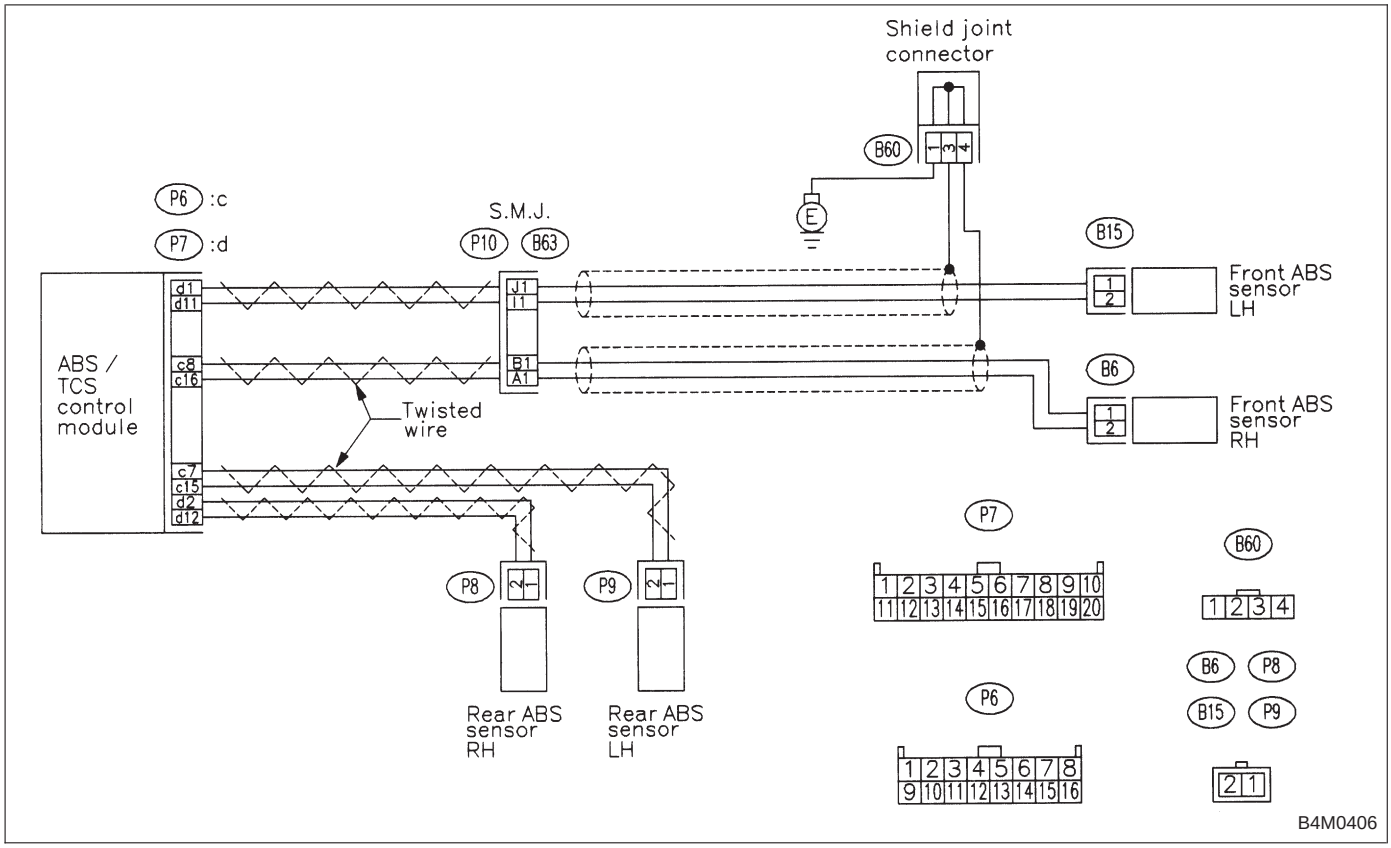
DIAGNOSIS:

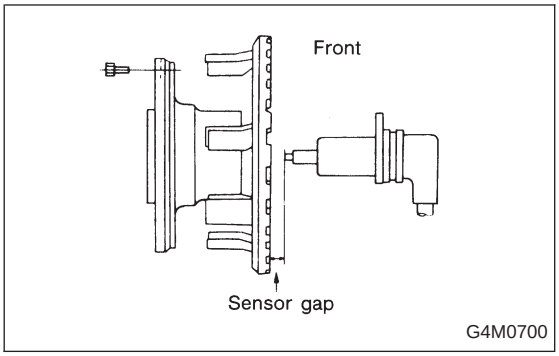
- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty hydraulic unit
- Faulty harness/connector
- Faulty ABS/TCS control module

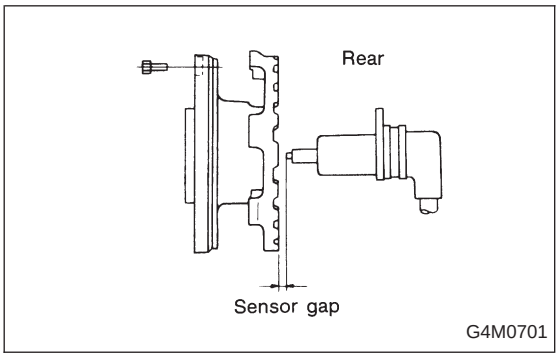
TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.
- TCS operates when should not.




Shield joint connector
B60
P6 :c
P7 :d
S.M.J.
P10
B63
E
B15
Front ABS sensor LH
B6
Front ABS sensor RH
ABS / TCS control module
Twisted wire
P8
P9
Rear ABS sensor RH
Rear ABS sensor LH
P7
B60
P6
B6
P8
B15
P9
B4M0406





1. CHECK ABS SENSOR MECHANICAL TROUBLE.

1) Dismount brake as outlined in manual to gain access to ABS sensor and tone wheel for inspection.
2) Check pole piece and tone wheel for accumulation of foreign particles. If necessary, remove foreign particles and clean.
3) Check tone wheel teeth for cracks for deformities. If necessary, replace tone wheel (No. of teeth: 44) with a new one.
4) Check tone wheel for looseness.

Tightening torque:
10 — 16 N·m (1 — 1.6 kg-m, 7 — 12 ft-lb)

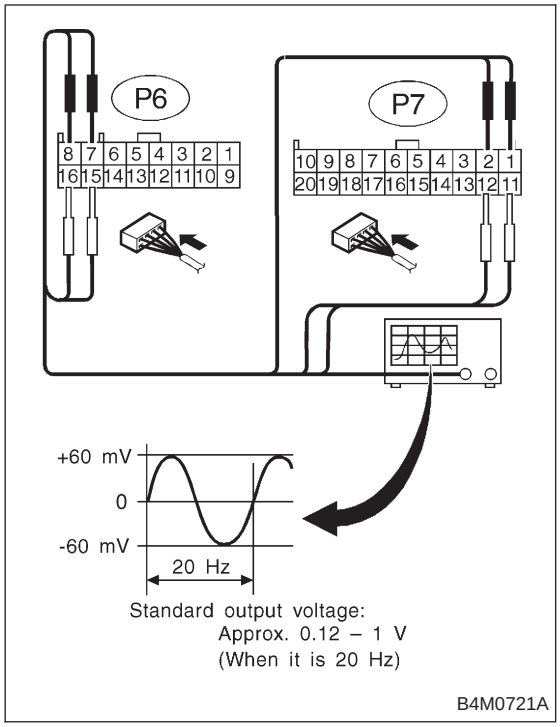
5) Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

If measurements check out “Not OK”, adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.
6) Check hub runout.

Specifications	0.05 mm (0.0020 in)

7) The following checks can be made if an oscilloscope is available.
(1) Raise all four wheels of ground.
(2) Turn ignition switch OFF.
(3) Connect all connectors to ABS control module.
(4) Connect the oscilloscope to the ABS control module connector in accordance with trouble code.
(5) Turn ignition switch ON.

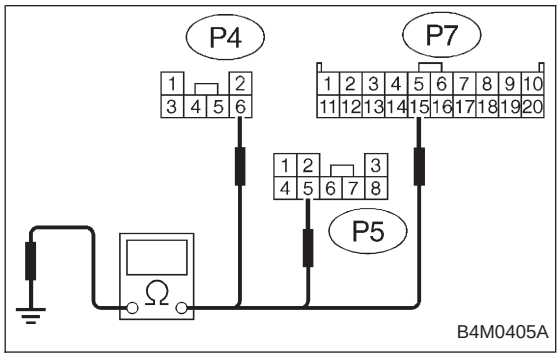


(6) Rotate wheels and measure voltage at specified frequency.

NOTE:
When this inspection is completed, the ABS/TCS control module sometimes stores the trouble code.

TROUBLE CODE / Connector & terminal:

22 / (P6) No. 8 — No.16 (Connect terminal to oscilloscope earth head.)
24 / (P7) No. 1 — No.11 (Connect terminal to oscilloscope earth head.)
26 / (P7) No. 2 — No.12 (Connect terminal to oscilloscope earth head.)
28 / (P6) No. 7 — No.15 (Connect terminal to oscilloscope earth head.)
Specified voltage: 0.12 — 1 V (When it is 20 Hz.)

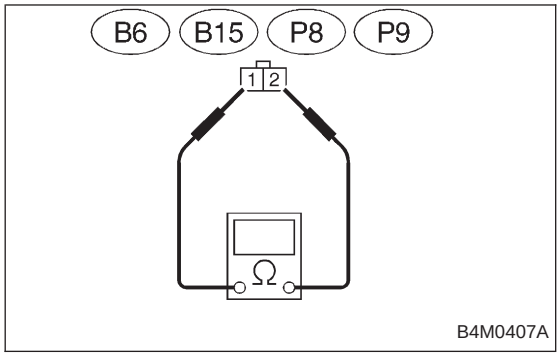


2. CHECK GROUND CIRCUIT OF ABS/TCS CONTROL MODULE.

1) Turn ignition switch OFF.
2) Disconnect connector from ABS/TCS control module.
3) Measure resistance between ABS/TCS control module connector and body.

Connector & terminal / Specified resistance:

(P4) No. 6 — body / 1 Ω or less
(P5) No. 5 — body / 1 Ω or less
(P7) No. 15 — body / 1 Ω or less



3. CHECK RESISTANCE OF ABS SENSOR.

1) Turn ignition switch OFF.
2) Disconnect connector from ABS sensor.
3) Measure resistance between ABS sensor connector terminals.

TROUBLE CODE / Connector & terminal:
22 / (B6) No. 1 — No. 2
24 / (B15) No. 1 — No. 2
26 / (P8) No. 1 — No. 2
28 / (P9) No. 1 — No. 2
Specified resistance: 0.8 — 1.2 kΩ

4. CHECK HARNESS CONNECTOR BETWEEN ABS/ TCS CONTROL MODULE AND ABS SENSOR.

Check for poor contacts in plug-in connectors. Refer to “Basic checks” in “FOREWORD”.

5. CHECK SOURCES OF SIGNAL NOISE.

1) Check that the mobile phone, personal radio and other wireless apparatus are correctly installed.
2) Check that the antenna and other possible noise sources are distant enough from the sensor harness.
3) Check that the sealed wires of the front harness sensor (in the engine room) are securely grounded.
4) Check that between ABS/TCS control module and the rear sensor harness has the correct twist pitch.

Twist pitch:
25 mm (0.98 in) or less

6. CHECK HYDRAULIC UNIT OPERATIONS.

1) Operate the ABS sequence control and check that the brake fluid pressure at the malfunctioning brake line increases and decreases properly. <Ref. to 4-4 [W20C0].>

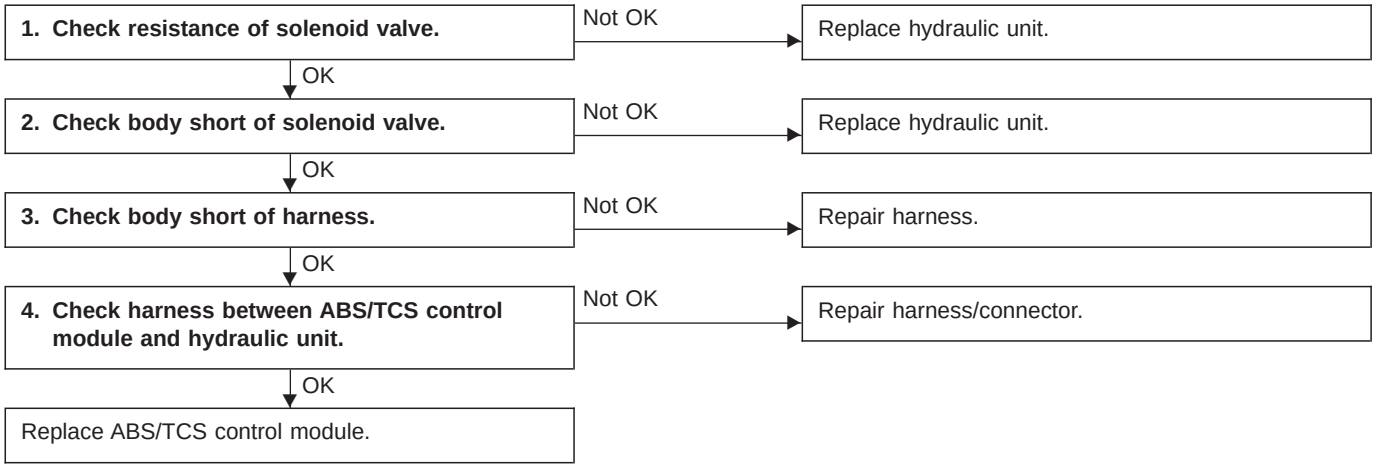
D: TROUBLE CODE 31, 33, 35, 37, 61 AND 62 — FAULTY INLET SOLENOID VALVE CIRCUIT(S) AND TCS SOLENOID VALVE CIRCUIT(S) IN HYDRAULIC UNIT —

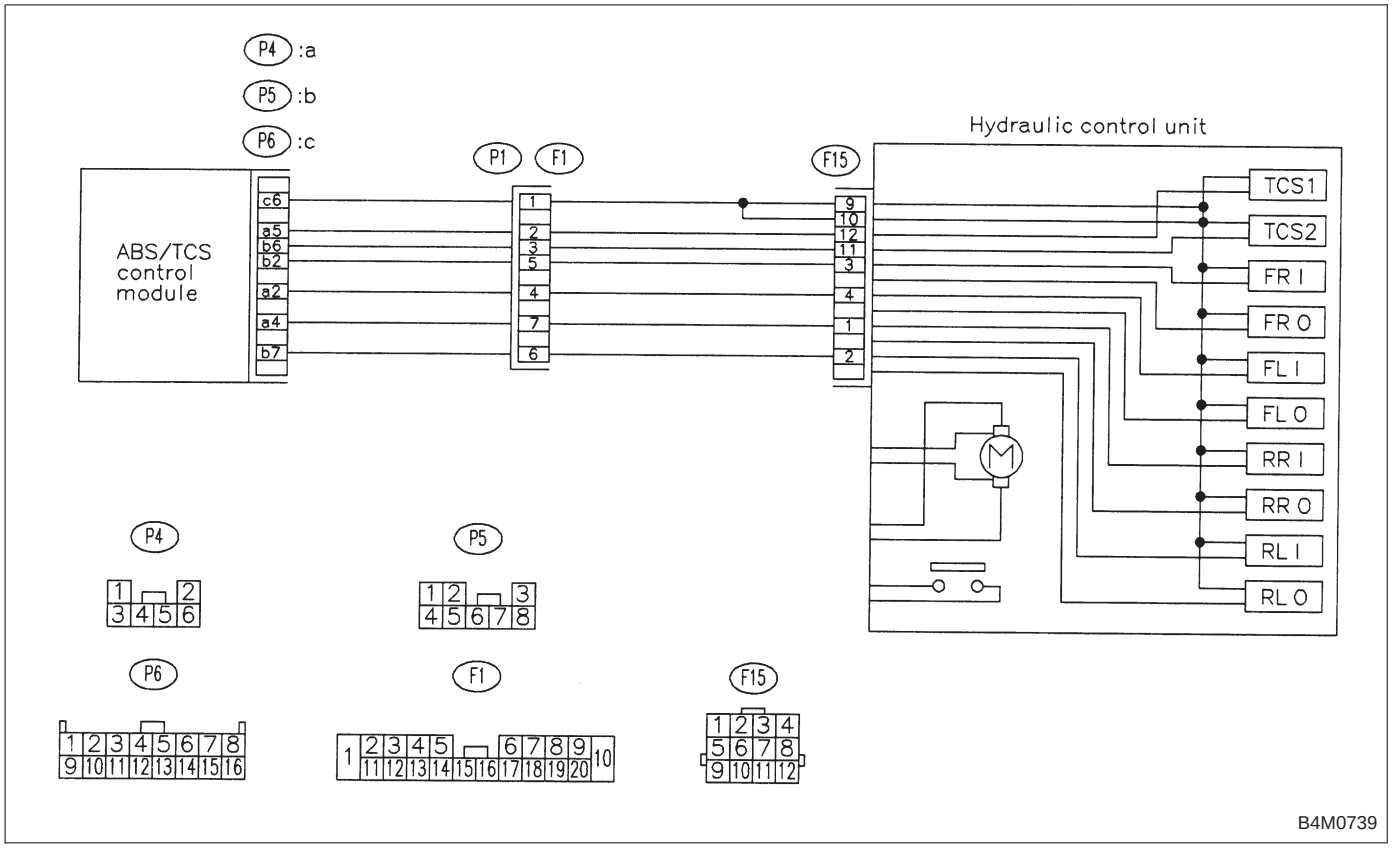
DIAGNOSIS:

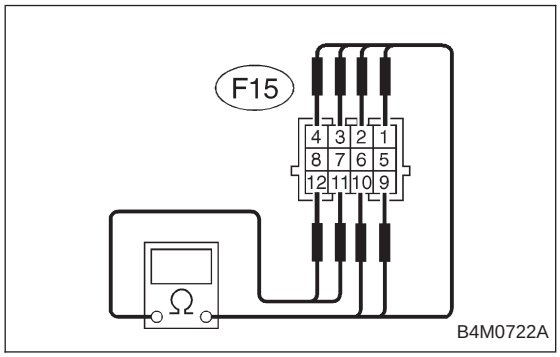
- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.





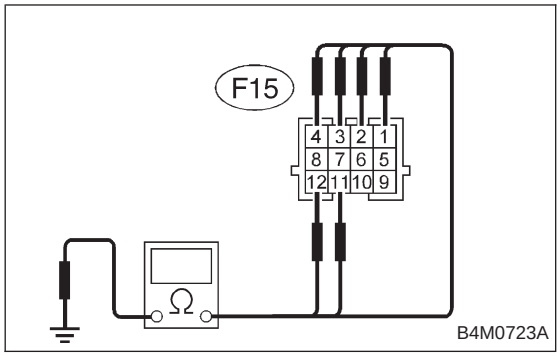


1. CHECK RESISTANCE OF SOLENOID VALVE.

1) Turn ignition switch OFF.
2) Disconnect connector from hydraulic unit.
3) Measure resistance between hydraulic unit terminals.

TROUBLE CODE / Connector & terminal:

31 / (F15) No. 3 — No. 9
33 / (F15) No. 4 — No. 10
35 / (F15) No. 1 — No. 10
37 / (F15) No. 2 — No. 9
61 / (F15) No. 12 — No. 9
62 / (F15) No. 11 — No. 10
Specified resistance: approx. 6±1 Ω

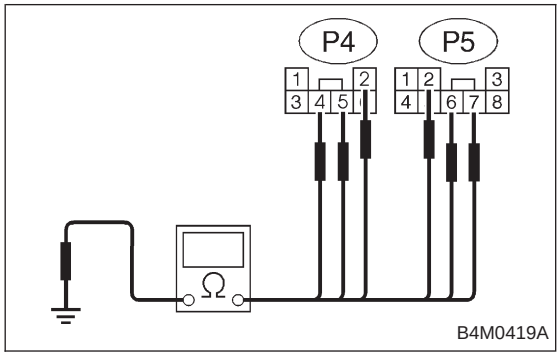


2. CHECK BODY SHORT OF SOLENOID VALVE.

1) Turn ignition switch OFF.
2) Disconnect connector from hydraulic unit.
3) Measure resistance between hydraulic unit terminals.

TROUBLE CODE / Connector & terminal:

31 / (F15) No. 3 — body
33 / (F15) No. 4 — body
35 / (F15) No. 1 — body
37 / (F15) No. 2 — body
61 / (F15) No. 12 — body
62 / (F15) No. 11 — body
Specified resistance: 1 MΩ or more

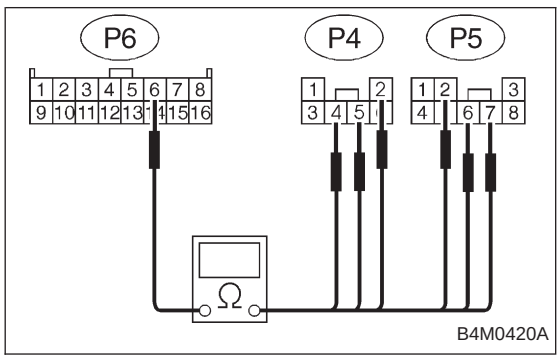


3. CHECK BODY SHORT OF HARNESS.

1) Turn ignition switch OFF.
2) Disconnect connector from hydraulic unit.
3) Disconnect connector from ABS/TCS control module.
4) Measure resistance between ABS/TCS control module connector terminals.

TROUBLE CODE / Connector & terminal:

31 / (P5) No. 2 — body
33 / (P4) No. 2 — body
35 / (P4) No. 4 — body
37 / (P5) No. 7 — body
61 / (P4) No. 5 — body
62 / (P5) No. 6 — body
Specified resistance: 1 MΩ or more



4. CHECK HARNESS BETWEEN ABS/TCS CONTROL MODULE AND HYDRAULIC UNIT.

1) Turn ignition switch OFF.
2) Connect connector to hydraulic unit.
3) Disconnect connector from ABS/TCS control module.
4) Measure resistance between ABS/TCS control module connector terminals.

TROUBLE CODE / Connector & terminal:

31 / (P5) No. 2 — (P6) No. 6
33 / (P4) No. 2 — (P6) No. 6

35 / (P4) No. 4 — (P6) No. 6
37 / (P5) No. 7 — (P6) No. 6
61 / (P4) No. 5 — (P6) No. 6
62 / (P5) No. 6 — (P6) No. 6
Specified resistance: 6.2±1.0 Ω

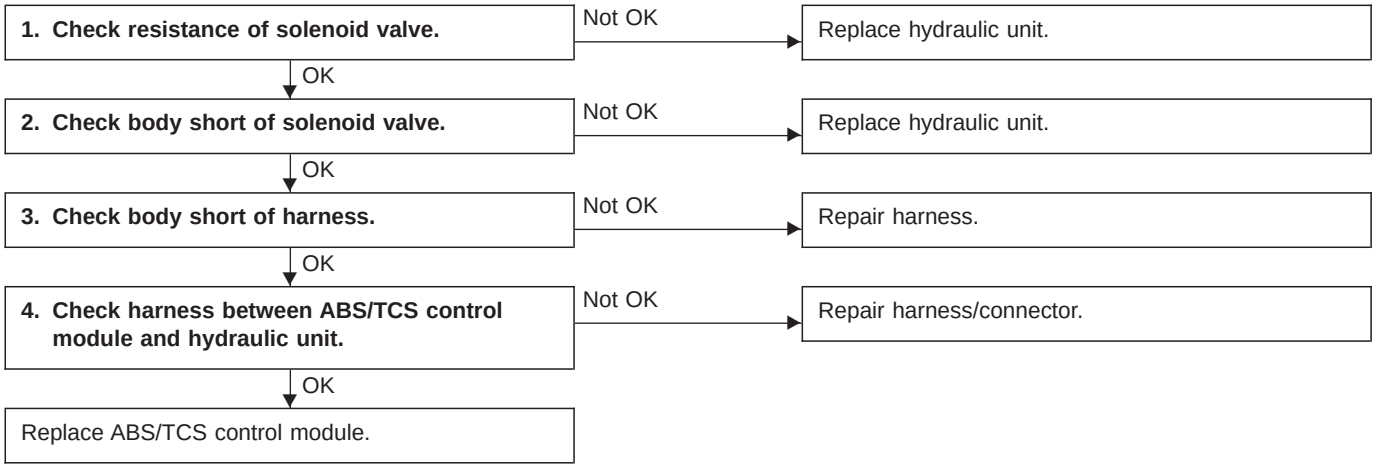
E: TROUBLE CODE 32, 34, 36 AND 38 — FAULTY OUTLET SOLENOID VALVE CIRCUIT(S) IN HYDRAULIC UNIT —

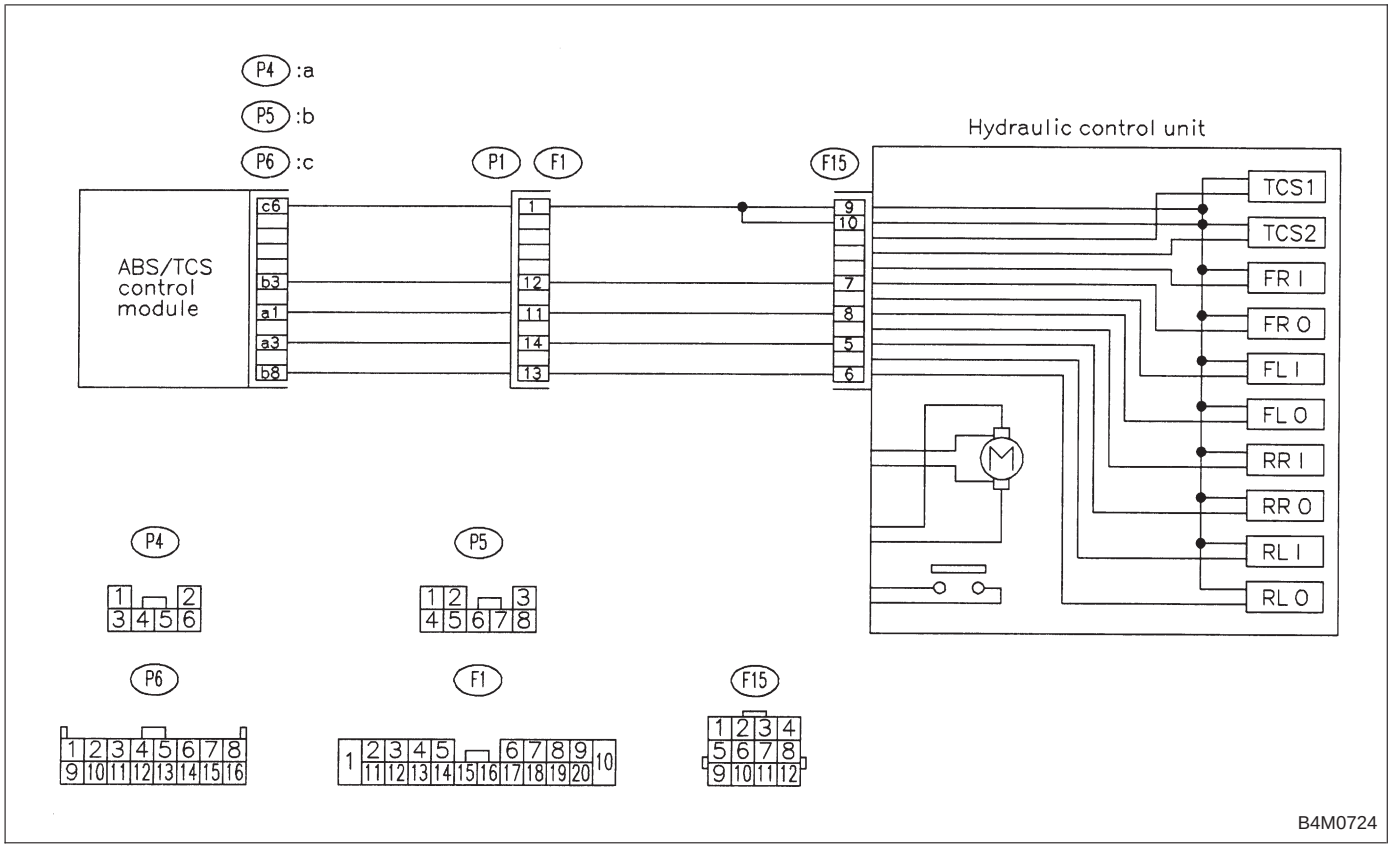
DIAGNOSIS:

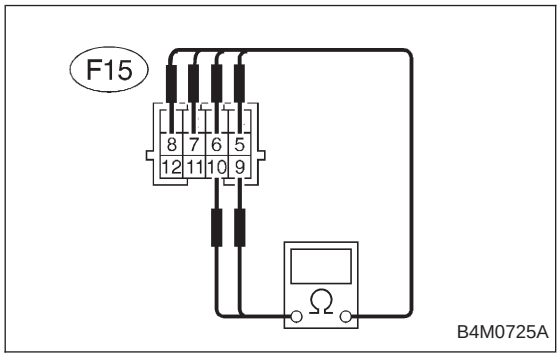
- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.





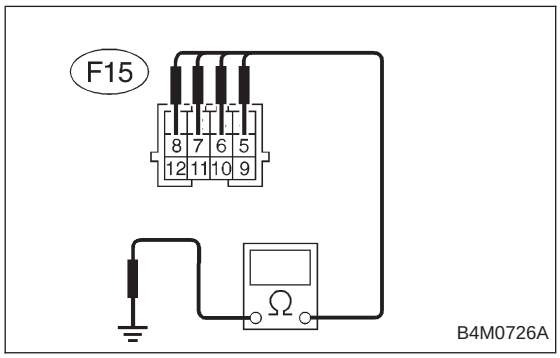


1. CHECK RESISTANCE OF SOLENOID VALVE.

1) Turn ignition switch OFF.
2) Disconnect connector from hydraulic unit.
3) Measure resistance between hydraulic unit terminals.

TROUBLE CODE / Connector & terminal:

32 / (F15) No. 7 — No. 9
34 / (F15) No. 8 — No. 10
36 / (F15) No. 5 — No. 10
38 / (F15) No. 6 — No. 9
Specified resistance: 3.5±1.0 Ω

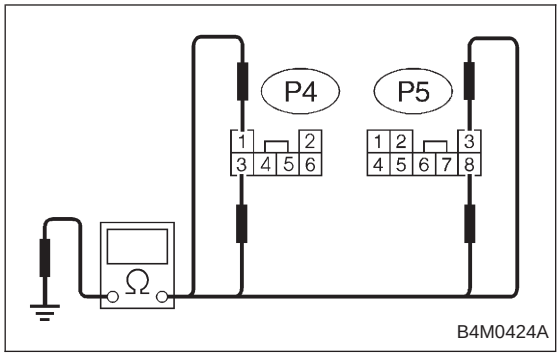


2. CHECK BODY SHORT OF SOLENOID VALVE.

1) Turn ignition switch OFF.
2) Disconnect connector from hydraulic unit.
3) Measure resistance between hydraulic unit terminals.

TROUBLE CODE / Connector & terminal:

32 / (F15) No. 7 — body
34 / (F15) No. 8 — body
36 / (F15) No. 5 — body
38 / (F15) No. 6 — body
Specified resistance: 1 MΩ or more

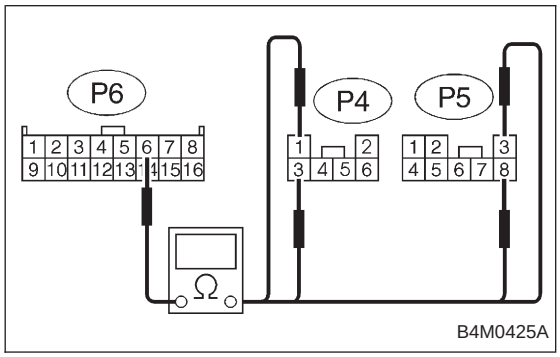


3. CHECK BODY SHORT OF HARNESS.

1) Turn ignition switch OFF.
2) Disconnect connector from hydraulic unit.
3) Disconnect connector from ABS/TCS control module.
4) Measure resistance between ABS/TCS control module connector terminals.

TROUBLE CODE / Connector & terminal:

32 / (P5) No. 3 — body
34 / (P4) No. 1 — body
36 / (P4) No. 3 — body
38 / (P5) No. 8 — body
Specified resistance: 1 MΩ or more



4. CHECK HARNESS BETWEEN ABS/TCS CONTROL MODULE AND HYDRAULIC UNIT.

1) Turn ignition switch OFF.
2) Connect connector to hydraulic unit.
3) Disconnect connector from ABS/TCS control module.
4) Measure resistance between ABS/TCS control module connector terminals.

TROUBLE CODE / Connector & terminal:

32 / (P5) No. 3 — (P6) No. 6
34 / (P4) No. 1 — (P6) No. 6
36 / (P4) No. 3 — (P6) No. 6
38 / (P5) No. 8 — (P6) No. 6
Specified resistance: 3.7±1.0 Ω

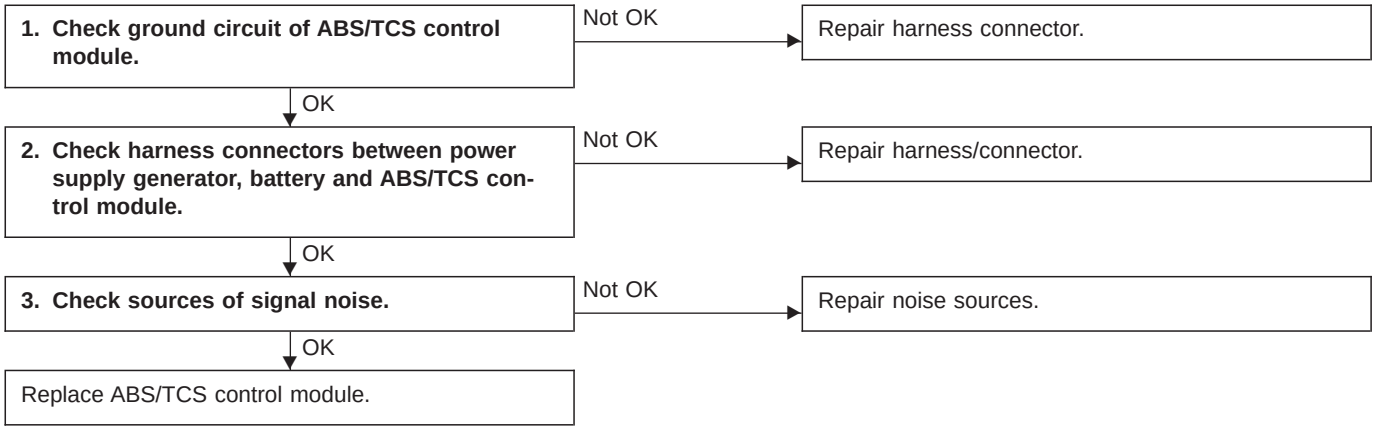
F: TROUBLE CODE 41 — FAULTY ABS/TCS CONTROL MODULE —

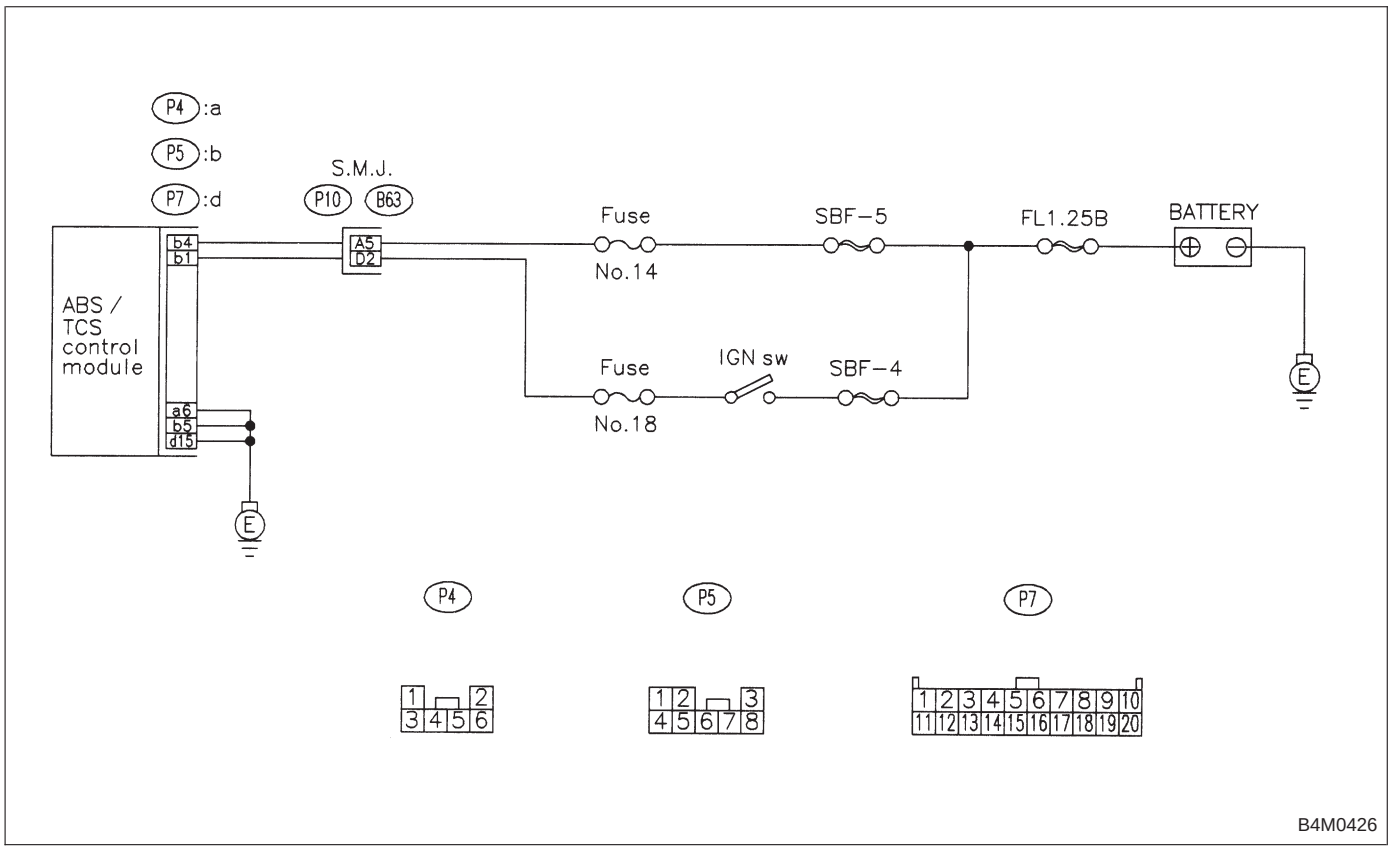
DIAGNOSIS:

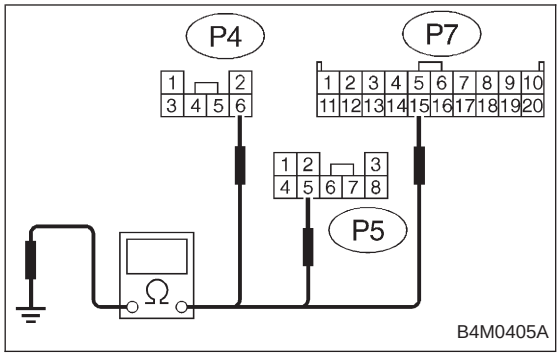
- Faulty ABS/TCS control module
- Faulty harness/connector

TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.







1. CHECK GROUND CIRCUIT OF ABS/TCS CONTROL MODULE.

1) Turn ignition switch OFF.
2) Disconnect connector from ABS/TCS control module.
3) Measure resistance between ABS/TCS control module connector and body.

Connector & terminal / Specified resistance:
(P4) No. 6 — body / 1 Ω or less
(P5) No. 5 — body / 1 Ω or less
(P7) No. 15 — body / 1 Ω or less

2. CHECK HARNESS CONNECTORS BETWEEN POWER SUPPLY GENERATOR, BATTERY AND ABS/TCS CONTROL MODULE.

Check for poor contacts in plug-in connectors. Refer to “Basic checks ” in “FOREWORD”.

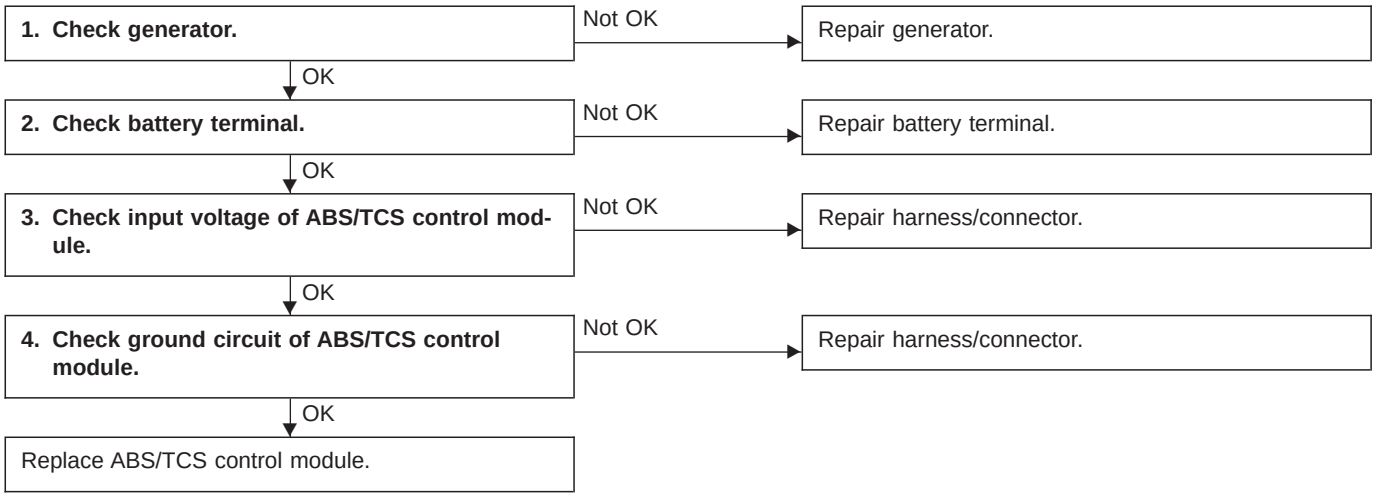
G: TROUBLE CODE 42 — SOURCE VOLTAGE IS HIGH. —

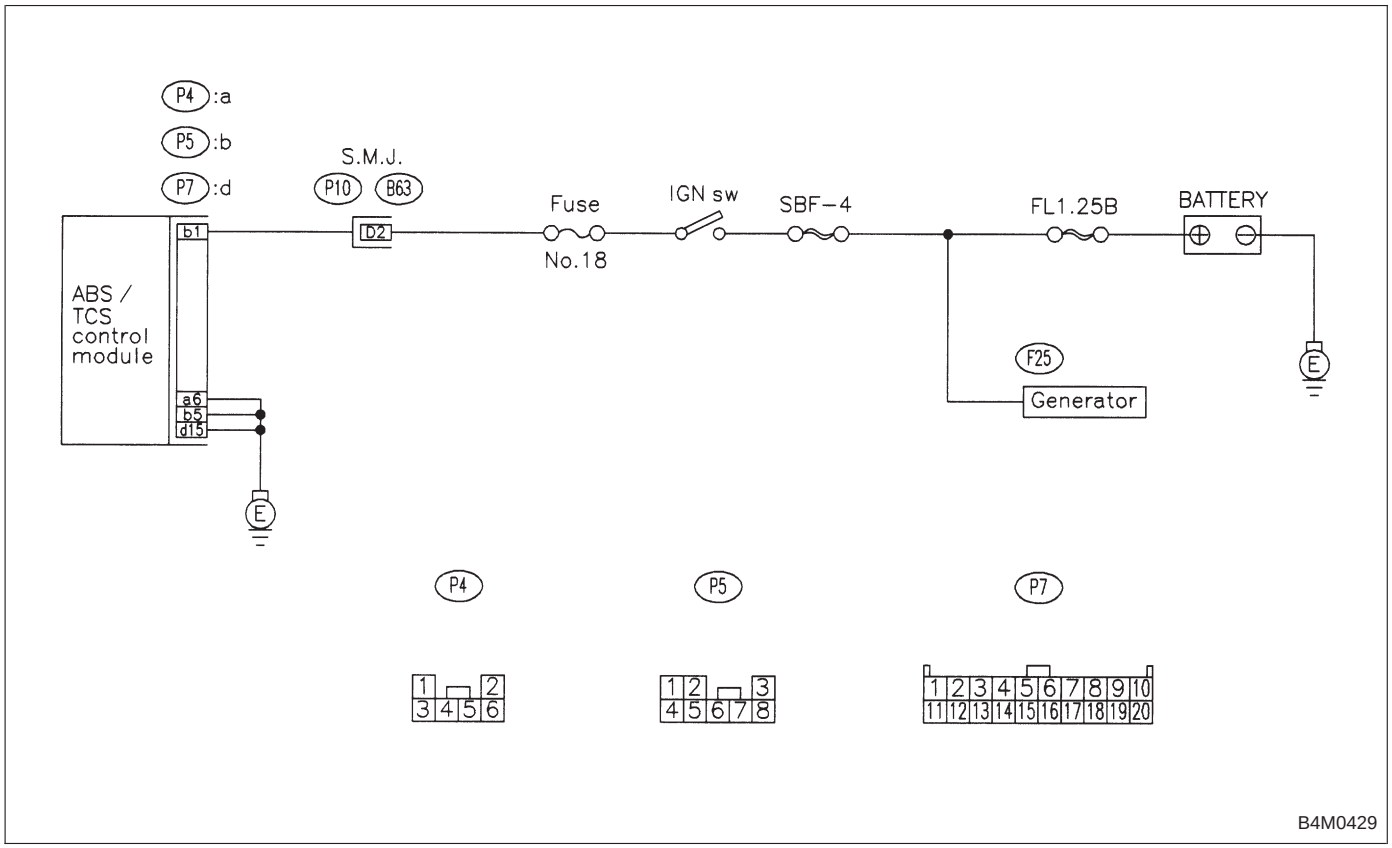
DIAGNOSIS:

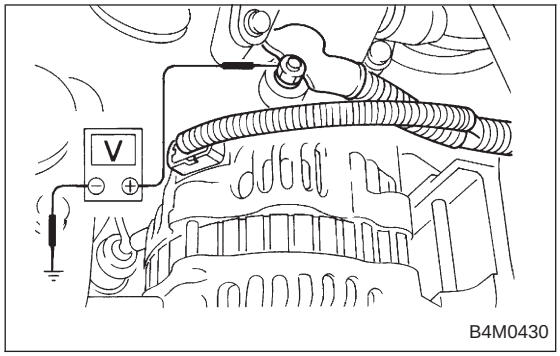
- Power source voltage of the ABS/TCS control module is more than 18 V.
- Faulty ABS/TCS control module
- Faulty harness/connector

TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.







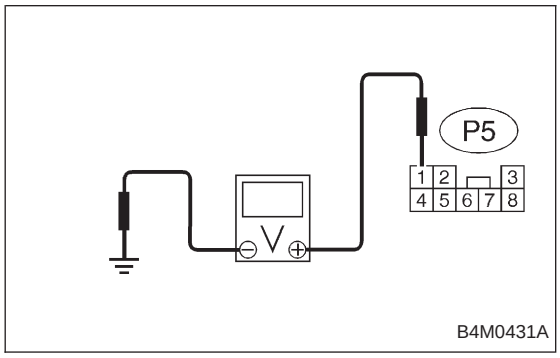
1. CHECK GENERATOR.

1) Idling after warm-up.
2) Measure voltage between generator B terminal and body.

Connector / Specified voltage:
(F25) — body / 10 — 15 V

2. CHECK BATTERY TERMINAL.

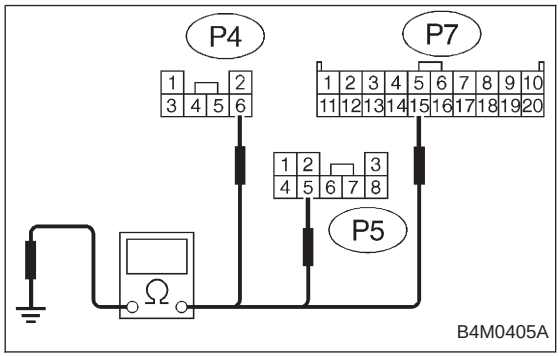
Check that the positive and negative battery terminals are firmly fixed.



3. CHECK INPUT VOLTAGE OF ABS/TCS CONTROL MODULE.

1) Turn ignition switch OFF.
2) Disconnect connector from ABS/TCS control module.
3) Run the engine at idle.
4) Measure voltage between ABS/TCS control module connector and body.

Connector & terminal / Specified voltage:
(P5) No. 1 — body / 10 — 15 V



4. CHECK GROUND CIRCUIT OF ABS/TCS CONTROL MODULE.

1) Turn ignition switch OFF.
2) Disconnect connector from ABS/TCS control module.
3) Measure resistance between ABS/TCS control module connector and body.

Connector & terminal / Specified resistance:
(P4) No. 6 — body / 1 Ω or less
(P5) No. 5 — body / 1 Ω or less
(P7) No. 15 — body / 1 Ω or less

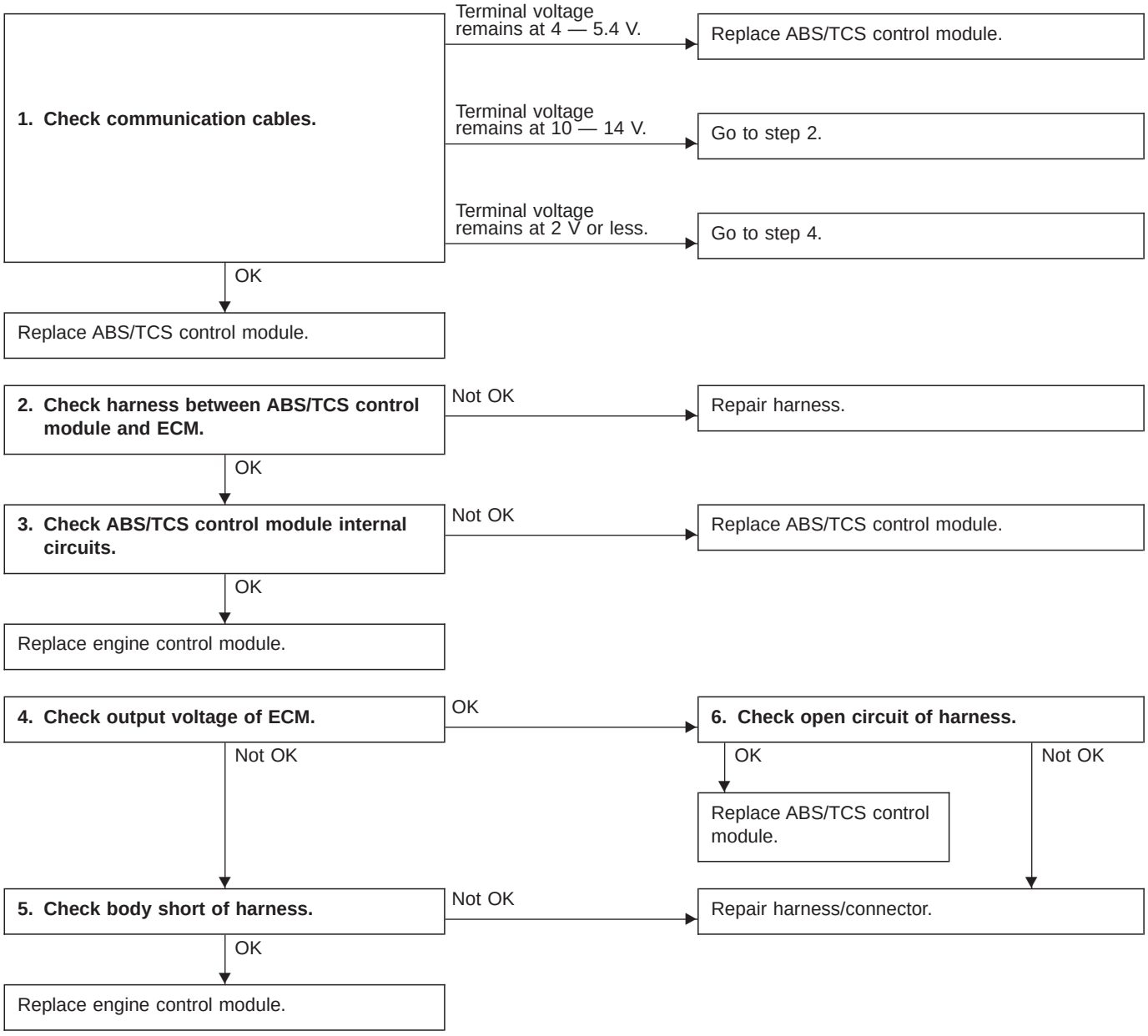
H: TROUBLE CODE 43 — FAULTY ENGINE CONTROL MODULE COMMUNICATION CABLES —

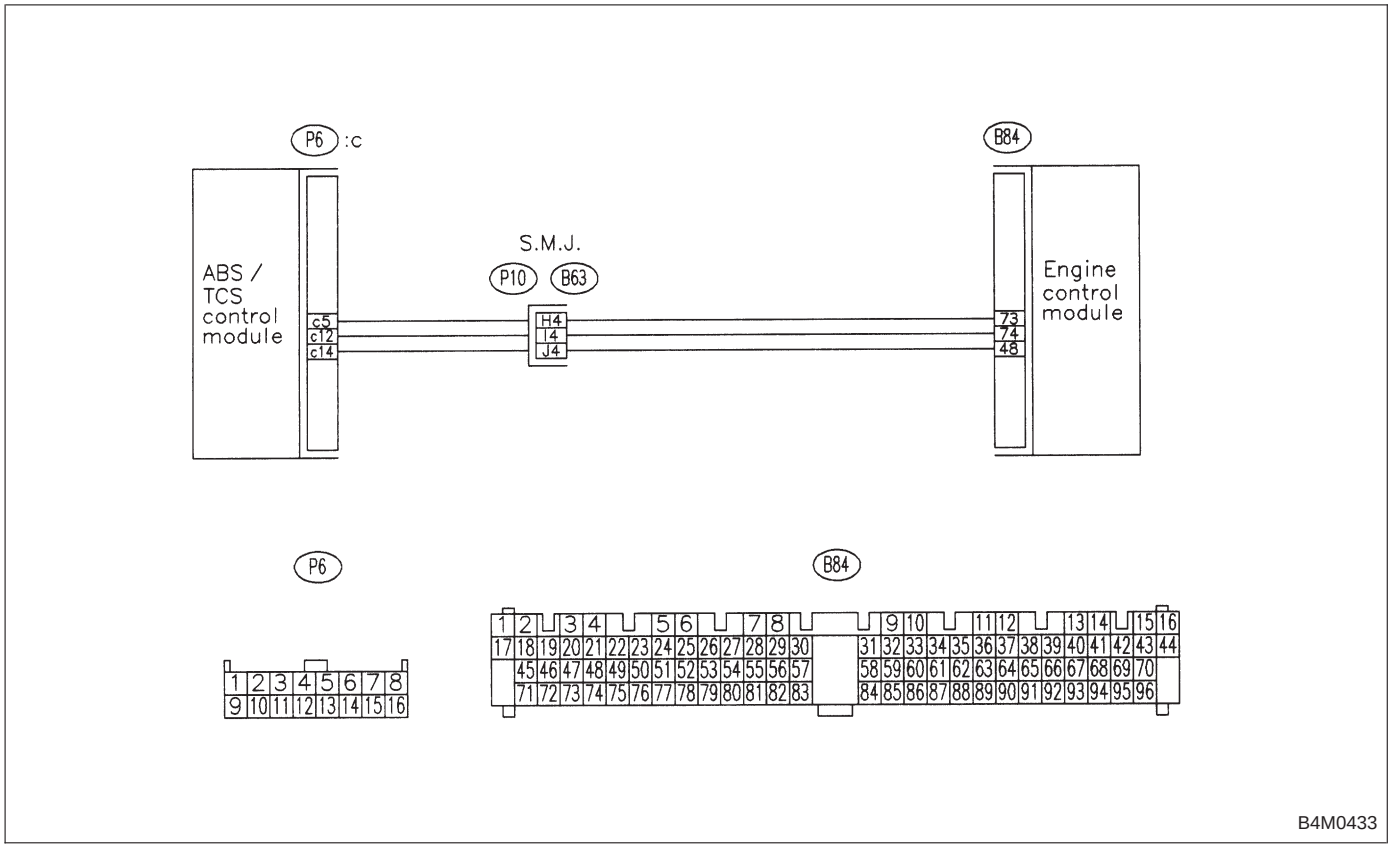
DIAGNOSIS:

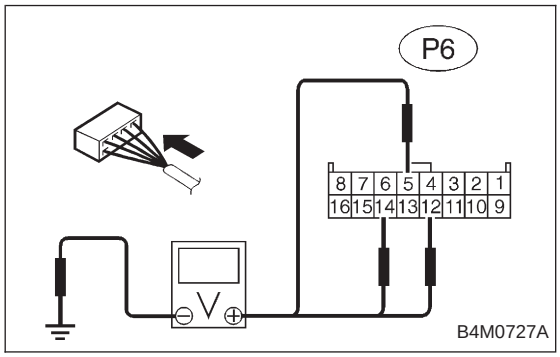
- AET communication cable is broken or short circuited.
- AEB communication cable is broken or short circuited.
- AEC communication cable is broken or short circuited.
- Faulty ABS/TCS control module
- Faulty engine control module

TROUBLE SYMPTOM:

- TCS does not operate.





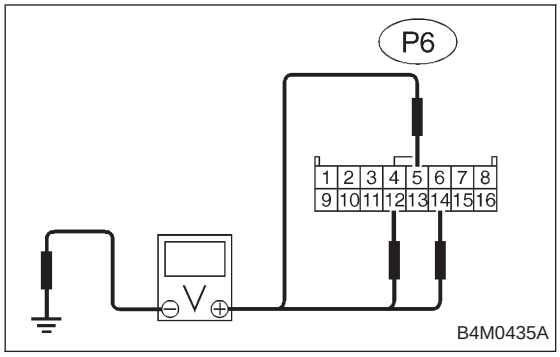


1. CHECK COMMUNICATION CABLES.

1) Operate the TCS sequence control.
<Ref. to 4-4 [W20F0].>
2) Measure the voltage between ABS/TCS control module and the body during the TCS check sequence operation.

Connector & terminal:
(P6) No. 12 — body (AET communication cable)
(P6) No. 5 — body (AEB communication cable)
(P6) No. 14 — body (AEC communication cable)

Specified voltage:
High voltage: 4 — 5.4 V
Low voltage: 2 V or less
Check that each of the above voltage reading are displayed.



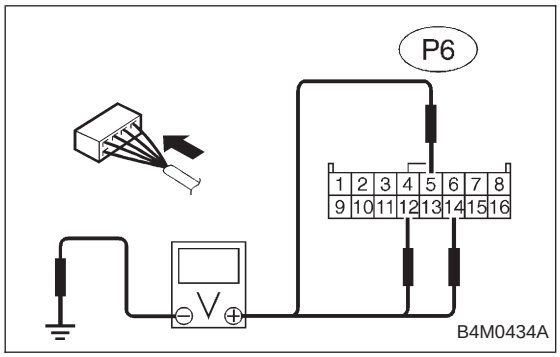
2. CHECK HARNESS BETWEEN ABS/TCS CONTROL MODULE AND ENGINE CONTROL MODULE.

1) Turn ignition switch OFF.
2) Disconnect engine control module.
3) Disconnect ABS/TCS control module.
4) Measure voltage between ABS/TCS control module connector and body.

Connector & terminal / Specified voltage:
(P6) No. 12 — body / 0 V (AET communication cable)
(P6) No. 5 — body / 0 V (AEB communication cable)
(P6) No. 14 — body / 0 V (AEC communication cable)

5) Turn ignition switch ON.
6) Measure voltage between ABS/TCS control module connector and body.

Connector & terminal / Specified voltage:
(P6) No. 12 — body / 0 V (AET communication cable)
(P6) No. 5 — body / 0 V (AEB communication cable)
(P6) No. 14 — body / 0 V (AEC communication cable)



3. CHECK ABS/TCS CONTROL MODULE INTERNAL CIRCUITS.

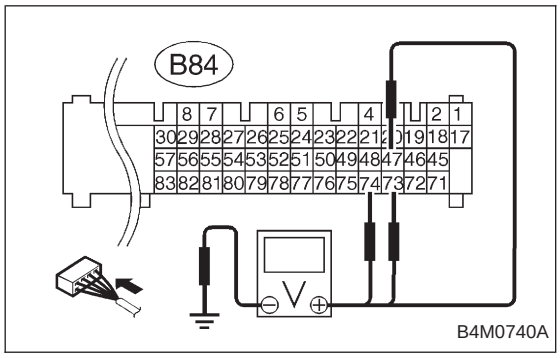
1) Turn ignition switch OFF.
2) Disconnect engine control module.
3) Connect ABS/TCS control module.
4) Measure voltage between ABS/TCS control module connector and body.

Connector & terminal / Specified voltage:
(P6) No. 12 — body / 2 V or less (AET communication cable)
(P6) No. 5 — body / 2 V or less (AEB communication cable)
(P6) No. 14 — body / 2 V or less (AEC communication cable)

5) Turn ignition switch ON.
6) Measure voltage between ABS/TCS control module connector and body.

Connector & terminal / Specified voltage:
(P6) No. 12 — body / 2 V or less (AET communication cable)
(P6) No. 5 — body / 2 V or less (AEB communica-

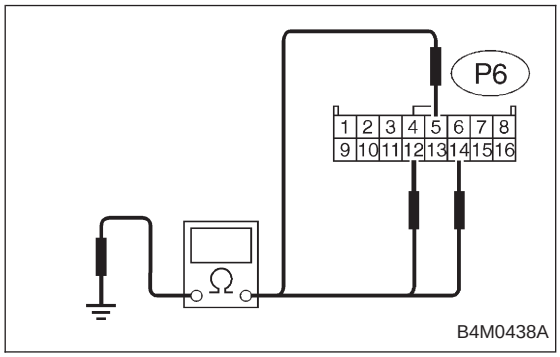
tion cable)
(P6) No. 14 — body / 2 V or less (AEC communication cable)



4. CHECK OUTPUT VOLTAGE OF ENGINE CONTROL MODULE.

1) Turn ignition switch OFF.
2) Connect engine control module.
3) Connect ABS/TCS control module.
4) Turn ignition switch ON.
5) Measure voltage between engine control module connector and body.

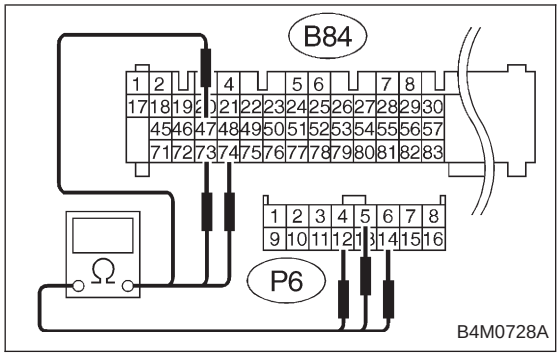
Connector & terminal / Specified voltage:
(B84) No. 74 — body / 4 — 5.4 V (AET communication cable)
(B84) No. 73 — body / 4 — 5.4 V (AEB communication cable)
(B84) No. 47 — body / 4 — 5.4 V (AEC communication cable)



5. CHECK BODY SHORT OF HARNESS.

1) Turn ignition switch OFF.
2) Disconnect engine control module.
3) Disconnect ABS/TCS control module.
4) Measure resistance between ABS/TCS control module connector and body.

Connector & terminal / Specified resistance:
(P6) No. 12 — body / 1 MΩ or more (AET communication cable)
(P6) No. 5 — body / 1 MΩ or more (AEB communication cable)
(P6) No. 14 — body / 1 MΩ or more (AEC communication cable)



6. CHECK OPEN CIRCUIT OF HARNESS.

1) Turn ignition switch OFF.
2) Disconnect engine control module.
3) Disconnect ABS/TCS control module.
4) Measure resistance between ABS/TCS control module connector and engine control module connector.

(P6) No. 12 — (B84) No. 74 / 1 Ω or less (AET communication cable)

(P6) No. 5 — (B84) No. 73 / 1 Ω or less (AEB communication cable)

(P6) No. 14 — (B84) No. 47 / 1 Ω or less (AEC communication cable)

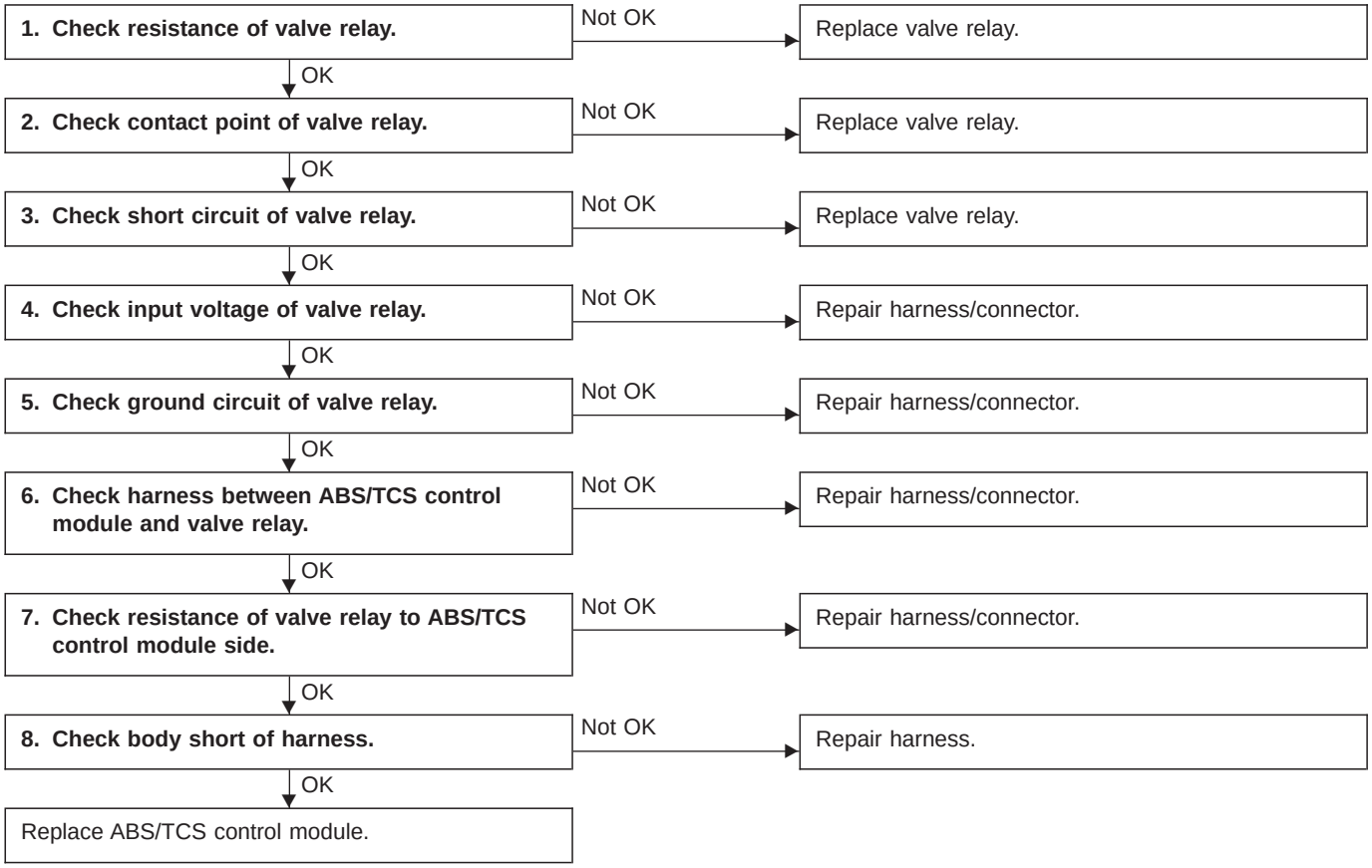
I: TROUBLE CODE 51 — FAULTY VALVE RELAY —

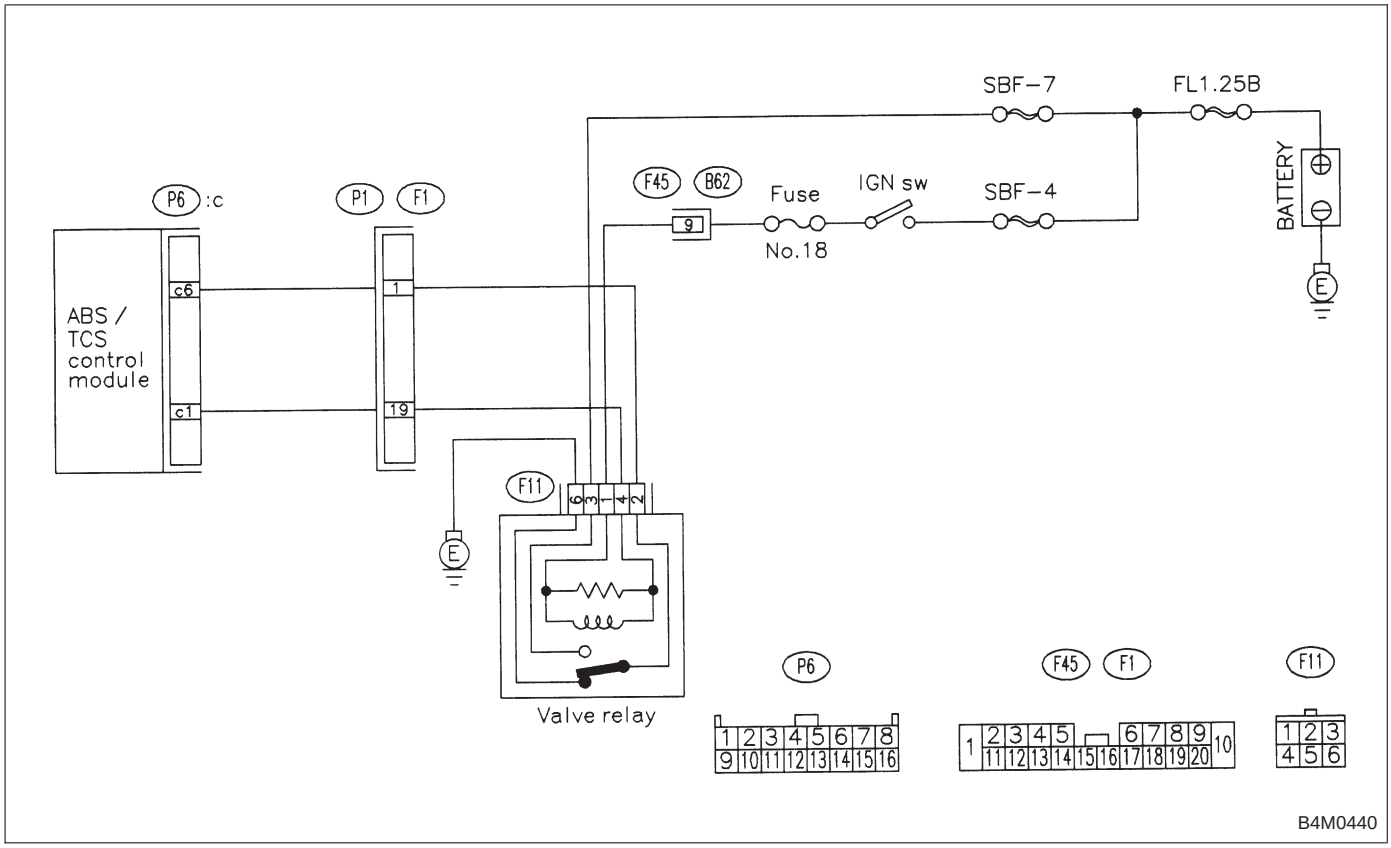
DIAGNOSIS:

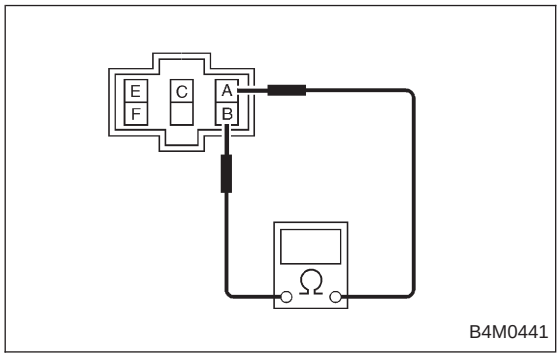
- Faulty valve relay
- Faulty harness/connector
- Faulty ABS/TCS control module

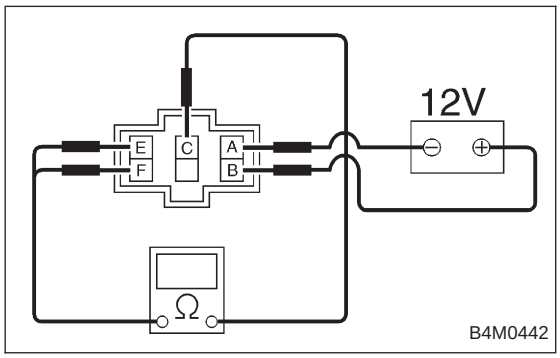
TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.









1. CHECK RESISTANCE OF VALVE RELAY.

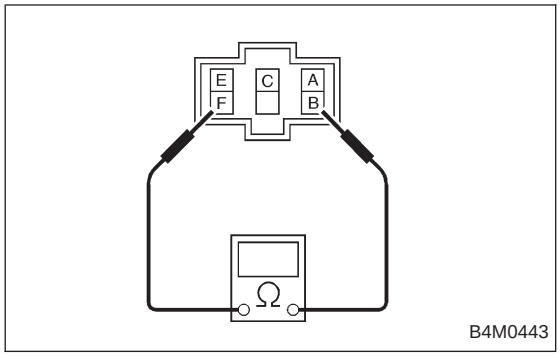
1) Turn ignition switch OFF.
2) Remove valve relay.
3) Measure resistance between valve relay terminals.

Terminal / Specified resistance:
No. A — B / 90±10 Ω

2. CHECK CONTACT POINT OF VALVE RELAY.

1) Turn ignition switch OFF.
2) Remove valve relay.
3) Attach circuit tester probes to terminals as shown in figure.
4) Measure resistance between respective terminals.

Terminal / Specified resistance:
No. C — E / 1 Ω or less (When 12 volts applied.)
No. C — E / 1 MΩ or more (When no voltage is applied.)
No. C — F / 1 MΩ or more (When 12 volts applied.)
No. C — F / 1 Ω or less (When no voltage is applied.)

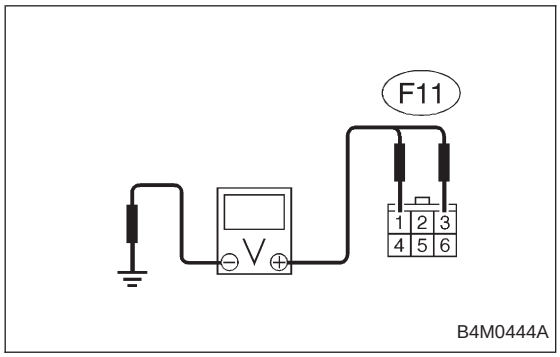


B4M0443

3. CHECK SHORT CIRCUIT OF VALVE RELAY.

1) Turn ignition switch OFF.
2) Remove valve relay.
3) Measure resistance between valve relay terminals.

Terminal / Specified resistance:
No. B — F / 1 MΩ or more



B4M0444A

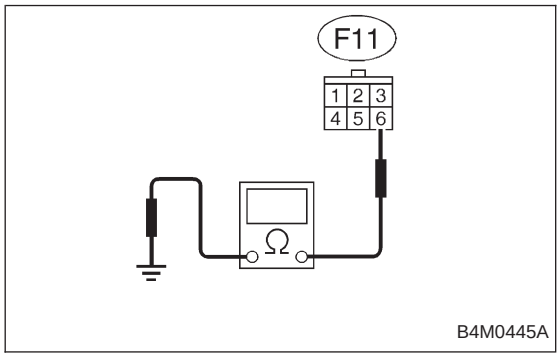
4. CHECK INPUT VOLTAGE OF VALVE RELAY.

1) Turn ignition switch OFF.
2) Disconnect valve relay.
3) Measure voltage between valve relay connector and body.

Connector & terminal / Specified voltage:
(F11) No. 1 — body / 0 V
(F11) No. 3 — body / 10 — 13 V

4) Turn ignition switch ON.
5) Measure voltage between valve relay connector and body.

Connector & terminal / Specified voltage:
(F11) No. 1 — body / 10 — 13 V
(F11) No. 3 — body / 10 — 13 V

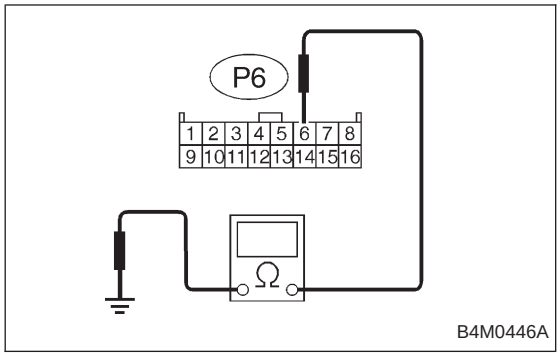


B4M0445A

5. CHECK GROUND CIRCUIT OF VALVE RELAY.

1) Turn ignition switch OFF.
2) Disconnect valve relay.
3) Disconnect ABS/TCS control module.
4) Measure resistance between valve relay connector and body.

Connector & terminal / Specified resistance:
(F11) No. 6 — body / 1 Ω or less



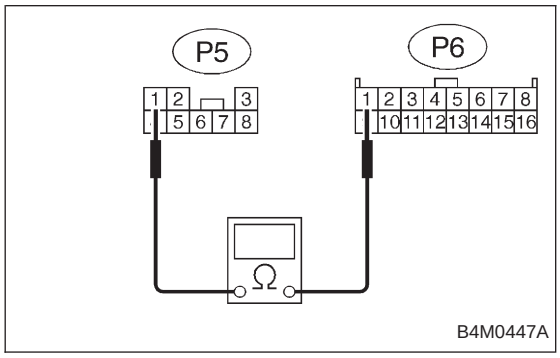
6. CHECK HARNESS BETWEEN ABS/TCS CONTROL MODULE AND VALVE RELAY.

1) Turn ignition switch OFF.
2) Disconnect valve relay.
3) Disconnect ABS/TCS control module.
4) Measure resistance between ABS/TCS control module connector and body.

Connector & terminal / Specified resistance:
(P6) No. 6 — body / 1 MΩ or more

5) Connect valve relay.
6) Measure resistance between ABS/TCS control module connector and body.

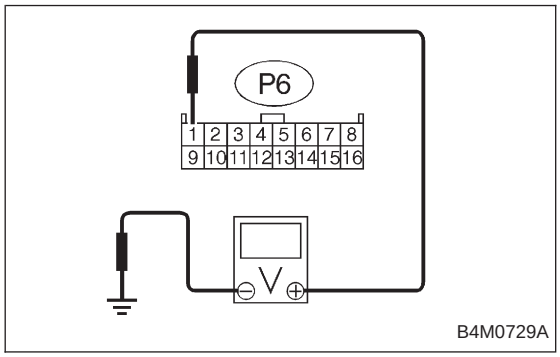
Connector & terminal / Specified resistance:
(P6) No. 6 — body / 1 Ω or less



7. CHECK RESISTANCE OF VALVE RELAY TO ABS/ TCS CONTROL MODULE SIDE.

1) Turn ignition switch OFF.
2) Connect valve relay.
3) Disconnect ABS/TCS control module.
4) Measure resistance between ABS/TCS control module connector terminals.

Connector & terminal / Specified resistance:
(P5) No. 1 — (P6) No. 1 / 90±10 Ω



8. CHECK BODY SHORT OF HARNESS.

1) Turn ignition switch OFF.
2) Connect valve relay.
3) Disconnect ABS/TCS control module.
4) Turn ignition switch ON.
5) Measure voltage between ABS/TCS control module connector and body.

Connector & terminal / Specified voltage:
(P6) No. 1 — body / 10 — 13 V

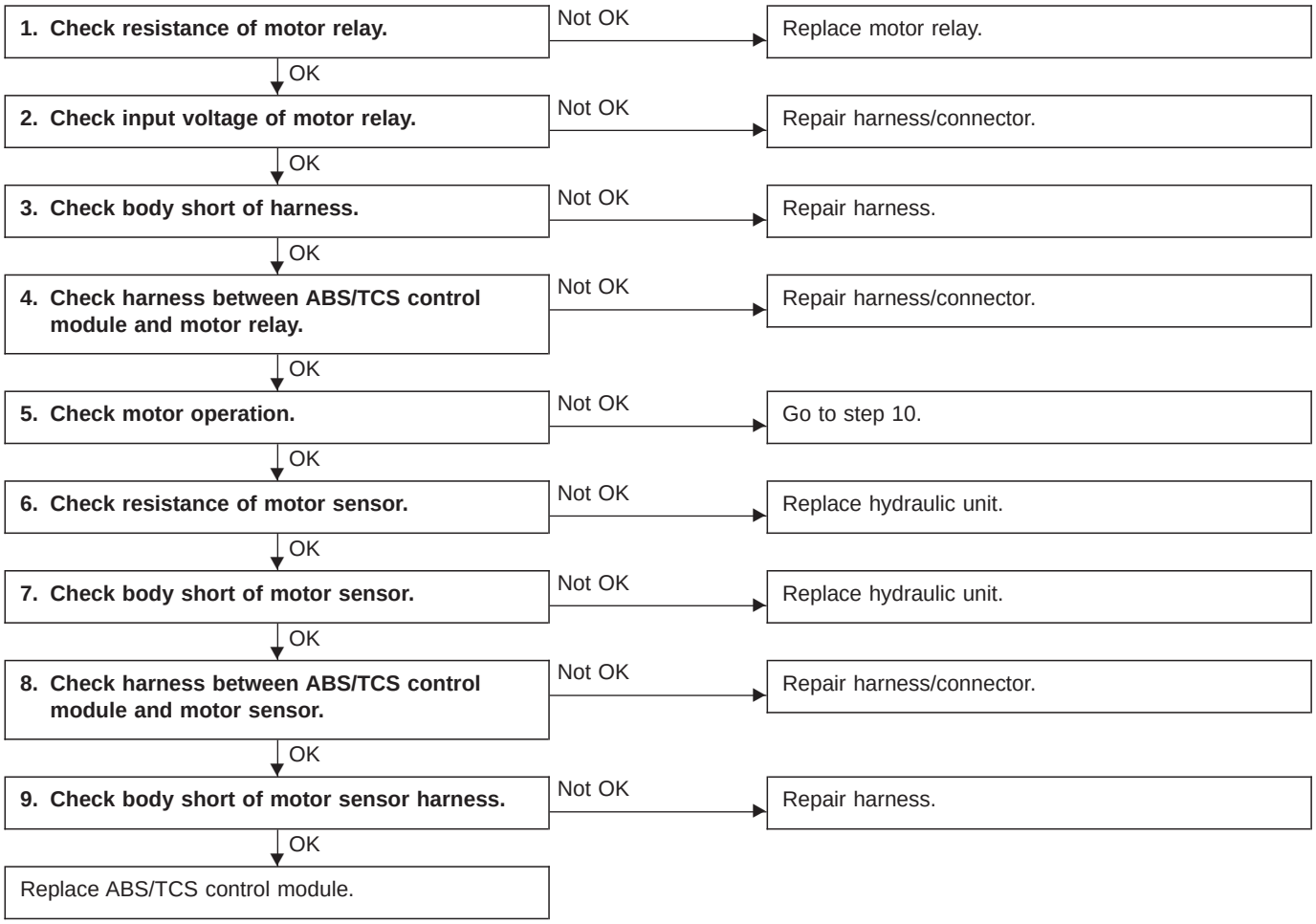
J: TROUBLE CODE 52 — FAULTY MOTOR, MOTOR SENSOR AND/OR MOTOR RELAY —

DIAGNOSIS:

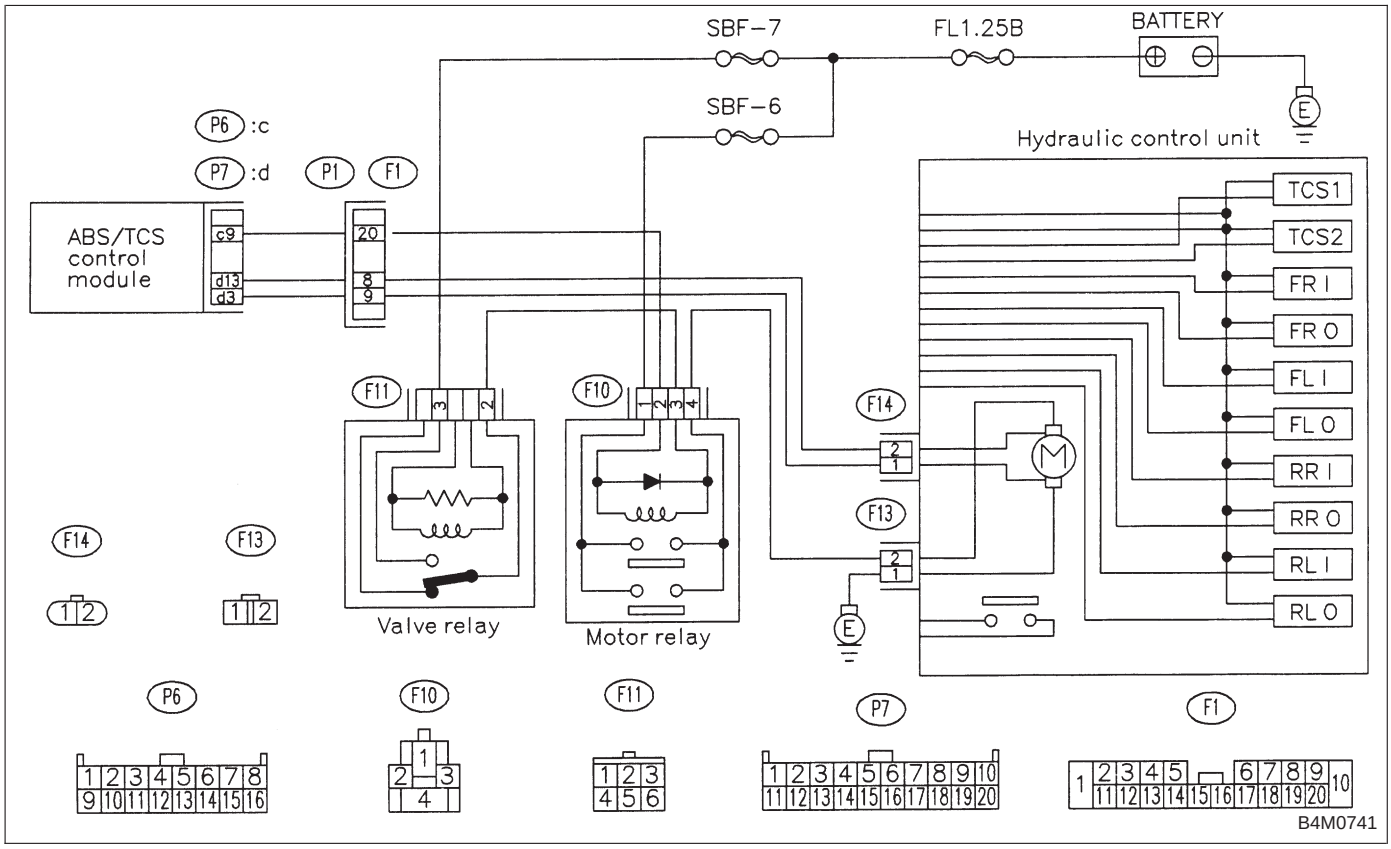
- Faulty motor relay
- Faulty motor
- Faulty motor sensor
- Faulty harness/connector
- Faulty ABS/TCS control module

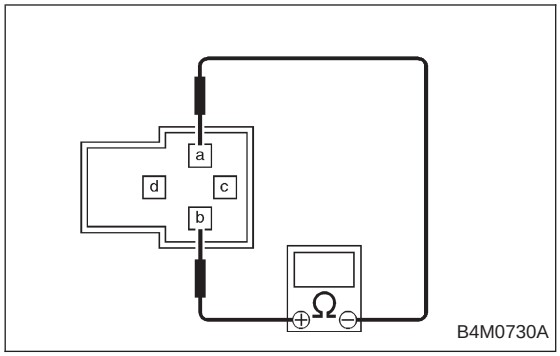
TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.



10. Check contact point of motor relay.	→	Replace motor relay.
OK ↓		
11. Check harness between motor and motor relay.	→	Repair harness/connector.
OK ↓		
12. Check body short of motor harness.	→	Repair harness.
OK ↓		
13. Check ground circuit of motor.	→	Repair harness/connector.
OK ↓		
Replace hydraulic unit.		



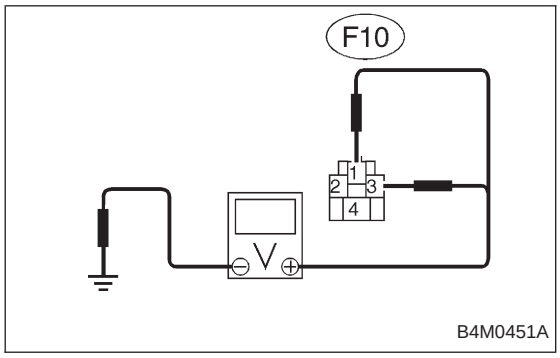


1. CHECK RESISTANCE OF MOTOR RELAY.

1) Turn ignition switch OFF.
2) Remove motor relay.
3) Measure resistance between motor relay terminals.

Terminal / Specified resistance:
No. a — b / 57 Ω

NOTE:
Apply + to b terminal.
Apply − to a terminal.



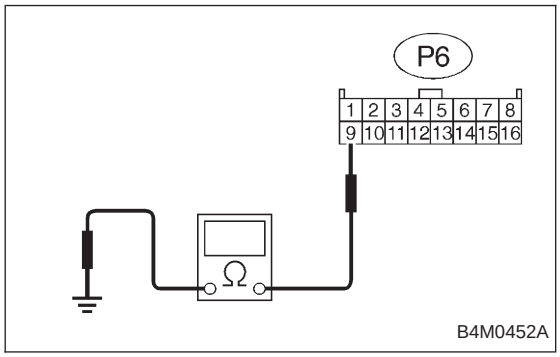
2. CHECK INPUT VOLTAGE OF MOTOR RELAY.

1) Turn ignition switch OFF.
2) Disconnect motor relay.
3) Measure voltage between motor relay connector and body.

Connector & terminal / Specified voltage:
(F10) No. 1 — body / 10 — 13 V
(F10) No. 3 — body / 0 V

4) Turn ignition switch ON.
5) Measure voltage between motor relay connector and body.

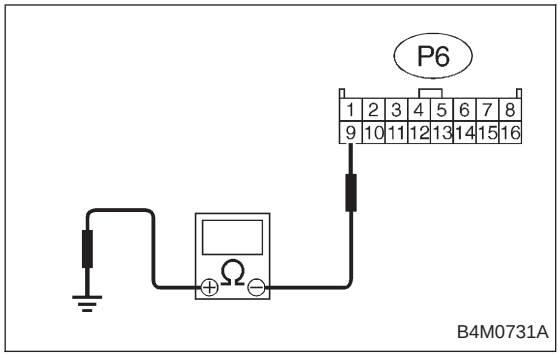
Connector & terminal / Specified voltage:
(F10) No. 1 — body / 10 — 13 V
(F10) No. 3 — body / 10 — 13 V (In 1 second after turning ignition key ON.)



3. CHECK BODY SHORT OF HARNESS.

1) Turn ignition switch OFF.
2) Disconnect motor relay.
3) Disconnect ABS/TCS control module.
4) Measure resistance between ABS/TCS control module connector and body.

Connector & terminal / Specified resistance:
(P6) No. 9 — body / 1 MΩ or more



4. CHECK HARNESS BETWEEN ABS/TCS CONTROL MODULE AND MOTOR RELAY.

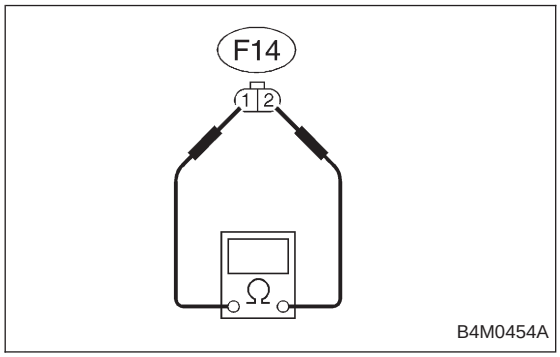
1) Turn ignition switch OFF.
2) Connect motor relay.
3) Disconnect ABS/TCS control module.
4) Measure resistance between ABS/TCS control module connector and body.

NOTE:
Apply + to GND.
Apply − to (P6) No. 9.

Connector & terminal / Specified resistance:
(P6) No. 9 — body / 57±6 Ω

5. CHECK MOTOR OPERATION.

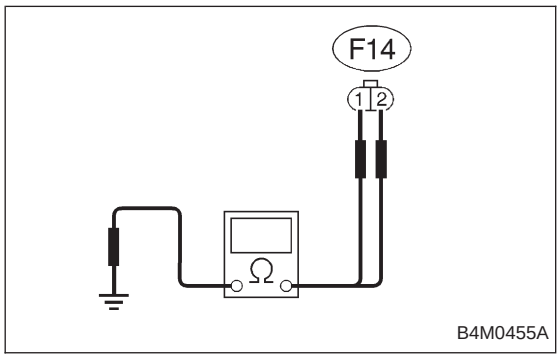
1) Connect motor relay.
2) Connect ABS/TCS control module.
3) Operate the TCS sequence check.
<Ref. to 4-4 [W20F0]. >
4) By the whirring sound check that the motor rotates.



6. CHECK RESISTANCE OF MOTOR SENSOR.

1) Turn ignition switch OFF.
2) Disconnect motor sensor connector.
3) Measure resistance between motor sensor connector terminals.

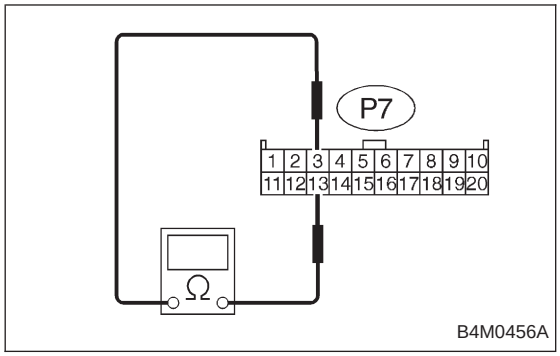
Connector & terminal / Specified resistance:
(F14) No. 1 — No. 2 / 72 — 98 Ω



7. CHECK BODY SHORT OF MOTOR SENSOR.

1) Turn ignition switch OFF.
2) Disconnect motor sensor connector.
3) Measure resistance between motor sensor connector and body.

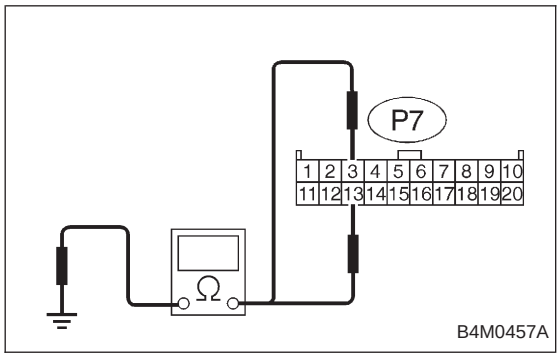
Connector & terminal / Specified resistance:
(F14) No. 1 — body / 1 MΩ or more
(F14) No. 2 — body / 1 MΩ or more



8. CHECK HARNESS BETWEEN ABS/TCS CONTROL MODULE AND MOTOR SENSOR.

1) Turn ignition switch OFF.
2) Connect motor sensor connector.
3) Disconnect ABS/TCS control module.
4) Measure resistance between ABS/TCS control module connector terminals.

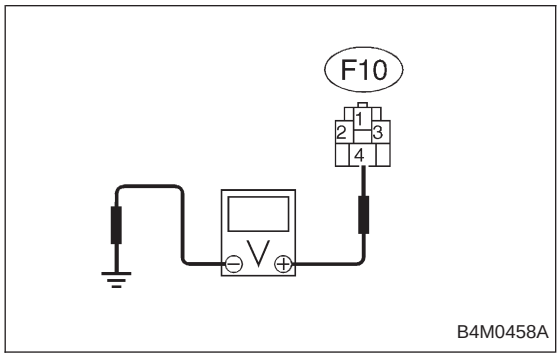
Connector & terminal / Specified resistance:
(P7) No. 3 — No. 13 / 72 — 98 Ω



9. CHECK BODY SHORT OF MOTOR SENSOR HARNESS.

1) Turn ignition switch OFF.
2) Connect motor sensor connector.
3) Disconnect ABS/TCS control module.
4) Measure resistance between ABS/TCS control module and body.

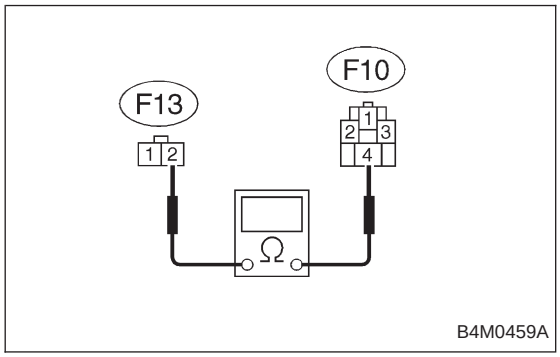
Connector & terminal / Specified resistance:
(P7) No. 3 — body / 1 MΩ or more
(P7) No. 13 — body / 1 MΩ or more



10. CHECK CONTACT POINT OF MOTOR RELAY.

1) Connect motor relay.
2) Connect ABS/TCS control module.
3) Operate the TCS sequence check. <Ref. to 4-4 [W20F0].>
4) Measure voltage between motor relay connector and body.

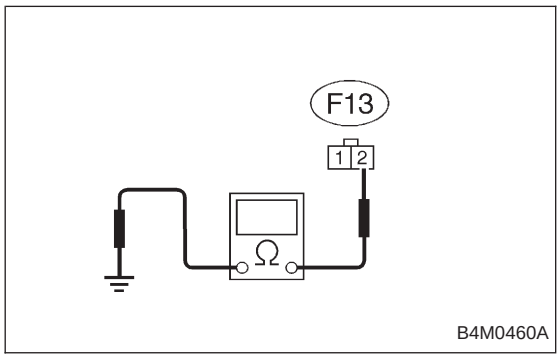
Connector & terminal / Specified voltage:
(F10) No. 4 — body / 10 — 14 V (While TCS operating indicator light is ON.)



11. CHECK HARNESS BETWEEN MOTOR AND MOTOR RELAY.

1) Turn ignition switch OFF.
2) Disconnect motor relay.
3) Disconnect motor connector.
4) Measure resistance between motor relay connector and motor connector.

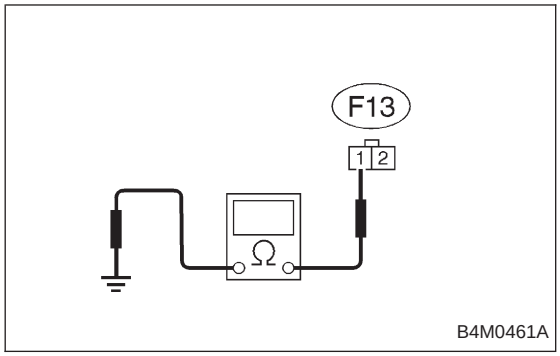
Connector & terminal / Specified resistance:
(F13) No. 2 — (F10) No. 4 / 1 Ω or less



12. CHECK BODY SHORT OF MOTOR HARNESS.

1) Turn ignition switch OFF.
2) Disconnect motor relay.
3) Disconnect motor connector.
4) Measure resistance between motor connector and body.

Connector & terminal / Specified resistance:
(F13) No. 2 — body / 1 MΩ or more



13. CHECK GROUND CIRCUIT OF MOTOR.

1) Turn ignition switch OFF.
2) Disconnect motor connector.
3) Measure resistance between motor connector and body.

Connector & terminal / Specified resistance:
(F13) No. 1 — body / 1 Ω or less

NOTE:
The check can also be made by analyzing the waves of the motor sensor output signal with oscilloscope during the TCS sequence control operation. If the ECM female connector end gives correct value, skip steps 6 through 9 above.
If not, operate the TCS sequence control again and measure the value at motor sensor male connector end with the motor sensor connector removed. If the value is OK, proceed with steps 8 and 9 above.

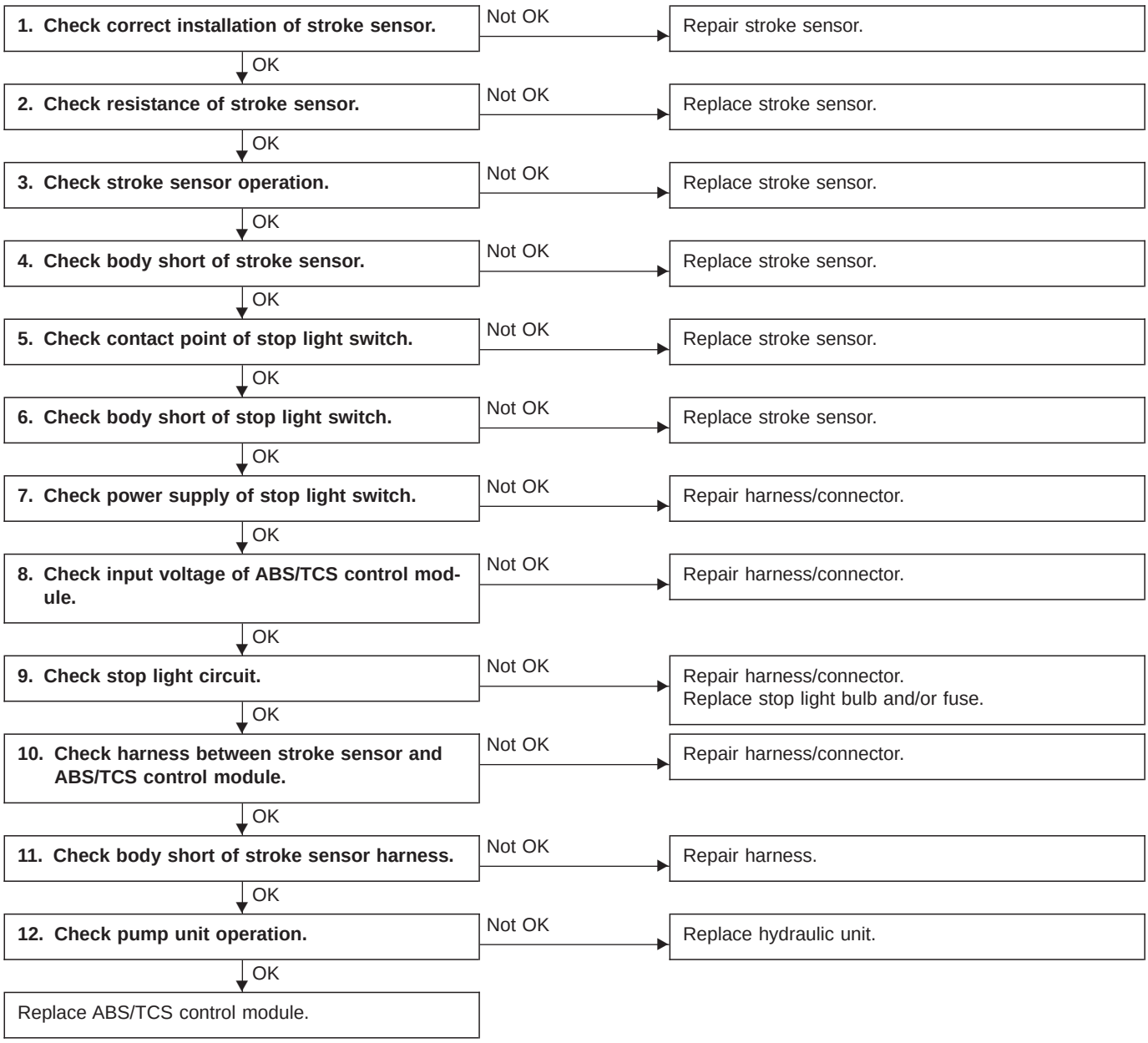
K: TROUBLE CODE 54 — FAULTY STROKE SENSOR AND/OR STOP LIGHT SWITCH —

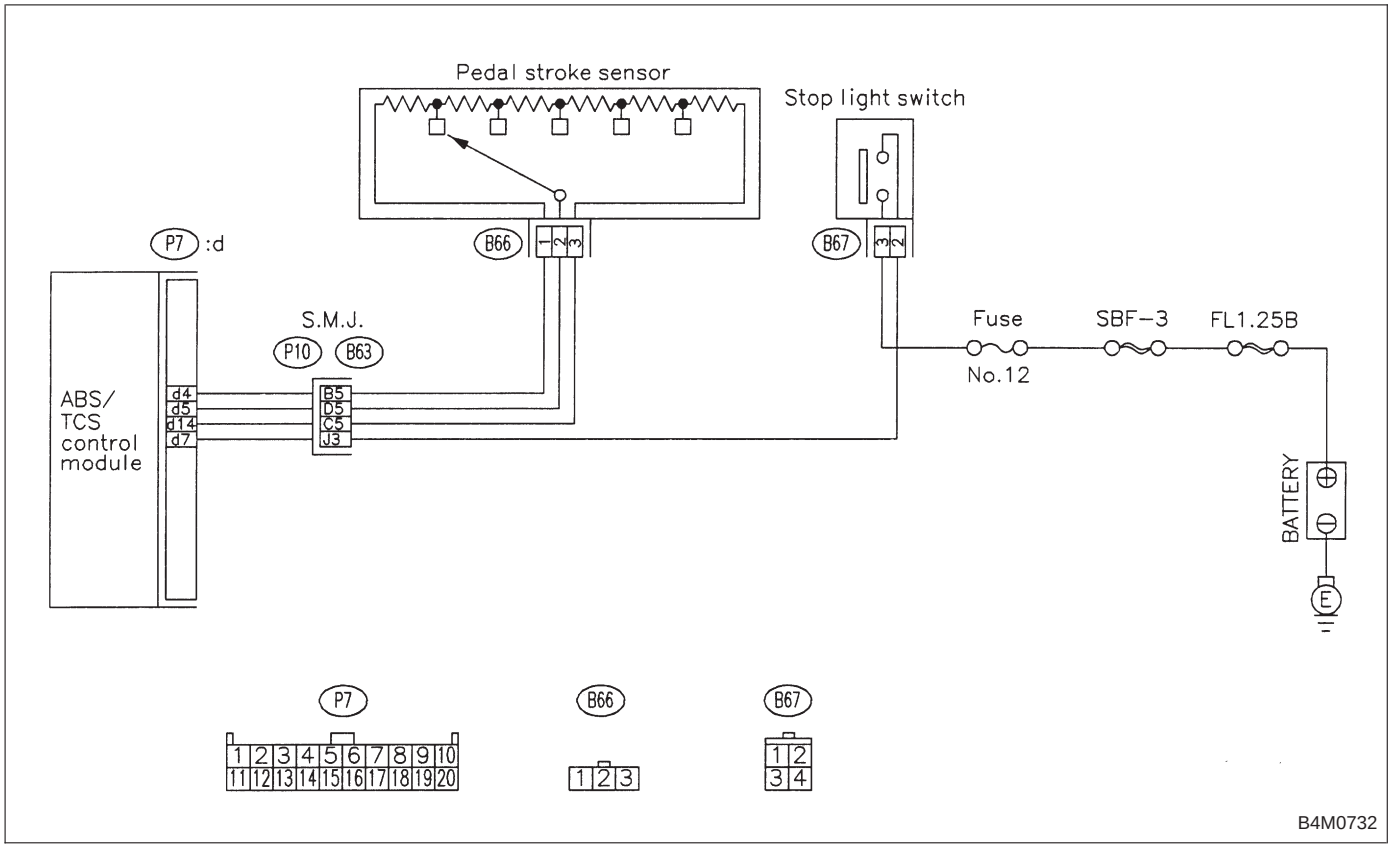
DIAGNOSIS:

- Faulty stroke sensor
- Faulty stop light switch
- Faulty pump unit in hydraulic unit
- Faulty ABS/TCS control module
- Faulty harness/connector

TROUBLE SYMPTOM:

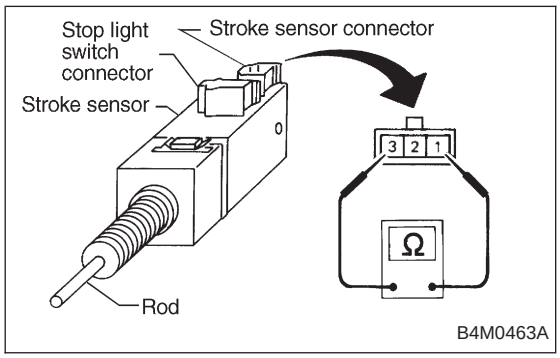
- ABS and TCS do not operate.
- No kick-back ocuurs while ABS is functioning.
- Only when the stop light switch circuit is broken, the ABS functions while TCS does not. (TCS warning light only illuminates.)


1. Check correct installation of stroke sensor.
Not OK
Repair stroke sensor.
OK
2. Check resistance of stroke sensor.
Not OK
Replace stroke sensor.
OK
3. Check stroke sensor operation.
Not OK
Replace stroke sensor.
OK
4. Check body short of stroke sensor.
Not OK
Replace stroke sensor.
OK
5. Check contact point of stop light switch.
Not OK
Replace stroke sensor.
OK
6. Check body short of stop light switch.
Not OK
Replace stroke sensor.
OK
7. Check power supply of stop light switch.
Not OK
Repair harness/connector.
OK
8. Check input voltage of ABS/TCS control module.
Not OK
Repair harness/connector.
OK
9. Check stop light circuit.
Not OK
Repair harness/connector.
Replace stop light bulb and/or fuse.
OK
10. Check harness between stroke sensor and ABS/TCS control module.
Not OK
Repair harness/connector.
OK
11. Check body short of stroke sensor harness.
Not OK
Repair harness.
OK
12. Check pump unit operation.
Not OK
Replace hydraulic unit.
OK
Replace ABS/TCS control module.



1. CHECK CORRECT INSTALLATION OF STROKE SENSOR.

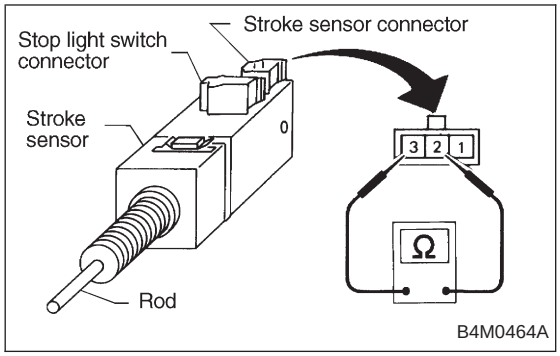
1) Check that the stroke sensor is firmly installed without play.
2) Check that the stop lamp does not remain illuminated.



2. CHECK RESISTANCE OF STROKE SENSOR.

1) Turn ignition switch OFF.
2) Disconnect stroke sensor connectors.
3) Remove stroke sensor.
4) Measure resistance between stroke sensor terminals.

Terminal / Specified resistance:
No. 1 — No. 3 / 570 — 630 Ω



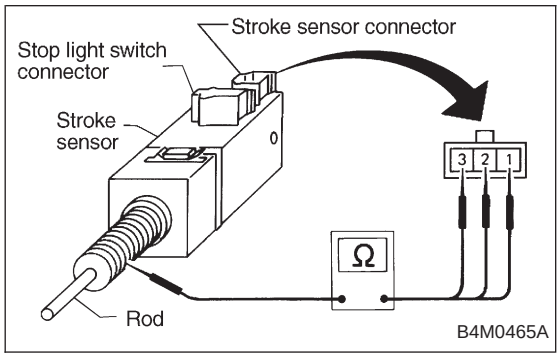
3. CHECK STROKE SENSOR OPERATION.

1) Turn ignition switch OFF.
2) Disconnect stroke sensor connectors.
3) Remove stroke sensor.
4) Measure the stroke sensor resistance against the rod stroke.

Terminal:
No. 3 — No. 2

Stroke Unit: mm (in)	Specified resistance
0 — 3.1±0.5 (0 — 0.122±0.020)	95 — 105 Ω
3.1 — 5.5±0.5 (0.122 — 0.217±0.020)	190 — 210 Ω
5.5 — 7.9±0.5 (0.217 — 0.311±0.020)	285 — 315 Ω
7.9 — 10.3±0.5 (0.311 — 0.406±0.020)	380 — 420 Ω
10.3 — 18±0.5 (0.406 — 0.709±0.020)	475 — 525 Ω

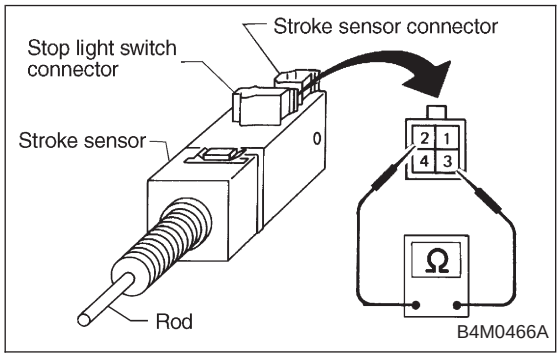
NOTE:
Stroke = 0 when the stroke sensor rod is completely drawn into the sensor unit.



4. CHECK BODY SHORT OF STROKE SENSOR.

1) Turn ignition switch OFF.
2) Disconnect stroke sensor connectors.
3) Remove stroke sensor.
4) Measure resistance between stroke sensor terminal and stroke sensor threads.

Terminal / Specified resistance:
No. 1 — stroke sensor threads/ 1 MΩ or more
No. 2 — stroke sensor threads/ 1 MΩ or more
No. 3 — stroke sensor threads/ 1 MΩ or more



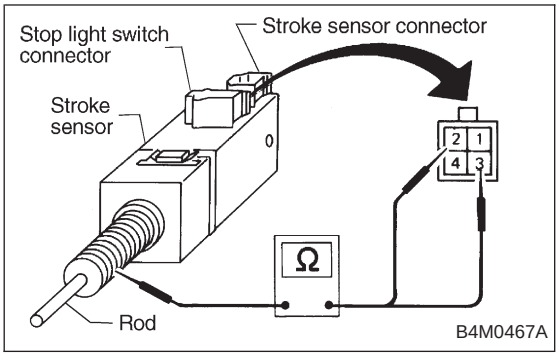
5. CHECK CONTACT POINT OF STOP LIGHT SWITCH.

1) Turn ignition switch OFF.
2) Disconnect stroke sensor connectors.
3) Remove stroke sensor.
4) Measure resistance between stroke sensor terminals.

Terminal:
No. 2 — No. 3

Stroke Unit mm (in)	Specified resistance
0 — 2.2±1.0 (0 — 0.087±0.039)	1 MΩ or more
2.2±1.0 — 18.0±0.5 (0.087±0.039 — 0.709±0.020)	1 Ω or less

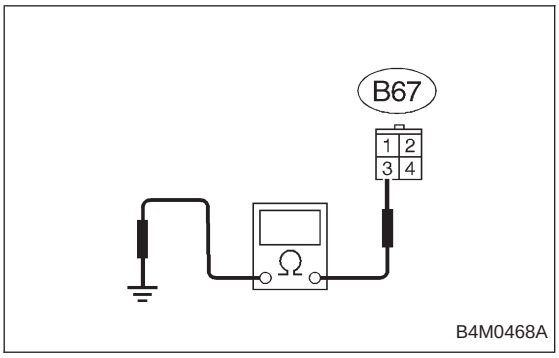
NOTE:
Stroke = 0 when the rod is completely drawn in.



6. CHECK BODY SHORT OF STOP LIGHT SWITCH.

1) Turn ignition switch OFF.
2) Disconnect stroke sensor connectors.
3) Remove stroke sensor.
4) Measure resistance between stroke sensor terminal and stroke sensor threads.

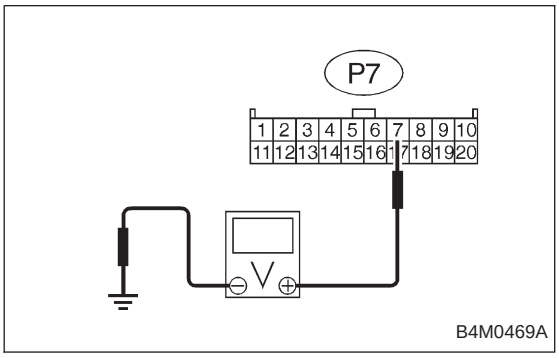
Terminal / Specified resistance:
No. 2 — stroke sensor threads / 1 MΩ or more
No. 3 — stroke sensor threads / 1 MΩ or more



7. CHECK POWER SUPPLY OF STOP LIGHT SWITCH.

1) Turn ignition switch OFF.
2) Disconnect stroke sensor connector.
3) Measure voltage between stroke sensor connector and body.

Connector & terminal / Specified voltage:
(B67) No. 3 — body / 10 — 13 V



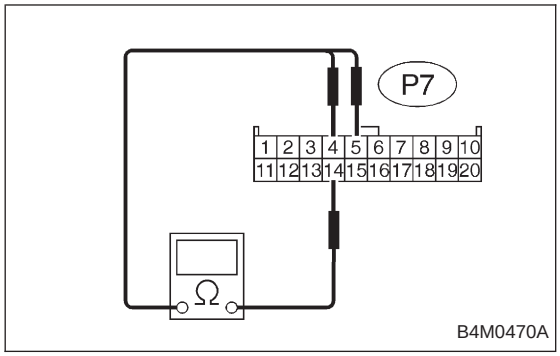
8. CHECK INPUT VOLTAGE OF ABS/TCS CONTROL MODULE.

1) Turn ignition switch OFF.
2) Install stroke sensor.
3) Connect stop light switch connector.
4) Disconnect ABS/TCS control module connector.
5) Measure voltage between ABS/TCS control module connector and body.

Connector & terminal / Specified voltage:
(P7) No. 7 — body / 10 — 13 V (With brake pedal depressed)
(P7) No. 7 — body / 0 V (Without brake pedal depressed)

9. CHECK STOP LIGHT CIRCUIT.

1) Turn ignition switch OFF.
2) Install stroke sensor.
3) Connect stroke sensor connector.
4) Connect ABS/TCS control module connector.
5) Depress brake pedal and check that the stop light comes on.

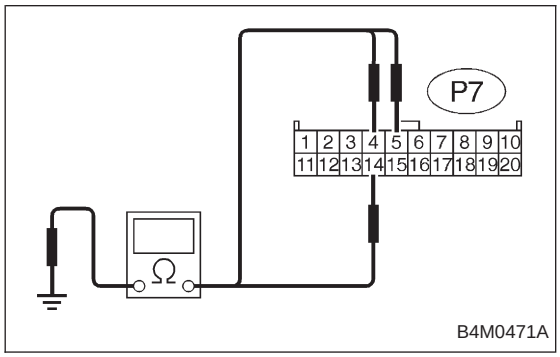


10. CHECK HARNESS BETWEEN STROKE SENSOR AND ABS/TCS CONTROL MODULE.

1) Turn ignition switch OFF.
2) Install stroke sensor.
3) Connect stroke sensor connector.
4) Disconnect ABS/TCS control module connector.
5) Measure resistance between ABS/TCS control module connector terminals.

Connector & terminal / Specified resistance:
(P7) No. 4 — No. 14 / 570 — 630 Ω
(P7) No. 5 — No. 14 / 95 — 105 Ω

NOTE:
Do not depress brake pedal.



11. CHECK BODY SHORT OF STROKE SENSOR HARNESS.

1) Turn ignition switch OFF.
2) Connect stroke sensor connector.
3) Disconnect ABS/TCS control module connector.
4) Measure resistance between ABS/TCS control module connector and body.

Connector & terminal / Specified resistance:
(P7) No. 4 — body / 1 MΩ or more
(P7) No. 5 — body / 1 MΩ or more
(P7) No. 14 — body / 1 MΩ or more

12. CHECK PUMP UNIT OPERATION.

1) Turn ignition switch OFF.
2) Connect stroke sensor connector.
3) Connect stop light switch connector.
4) Connect ABS/TCS control module connector.
5) Operate the TCS sequence control and check that the front brake fluid pressure increases and decreases correctly. <Ref. to 4-4 [W20F0].>

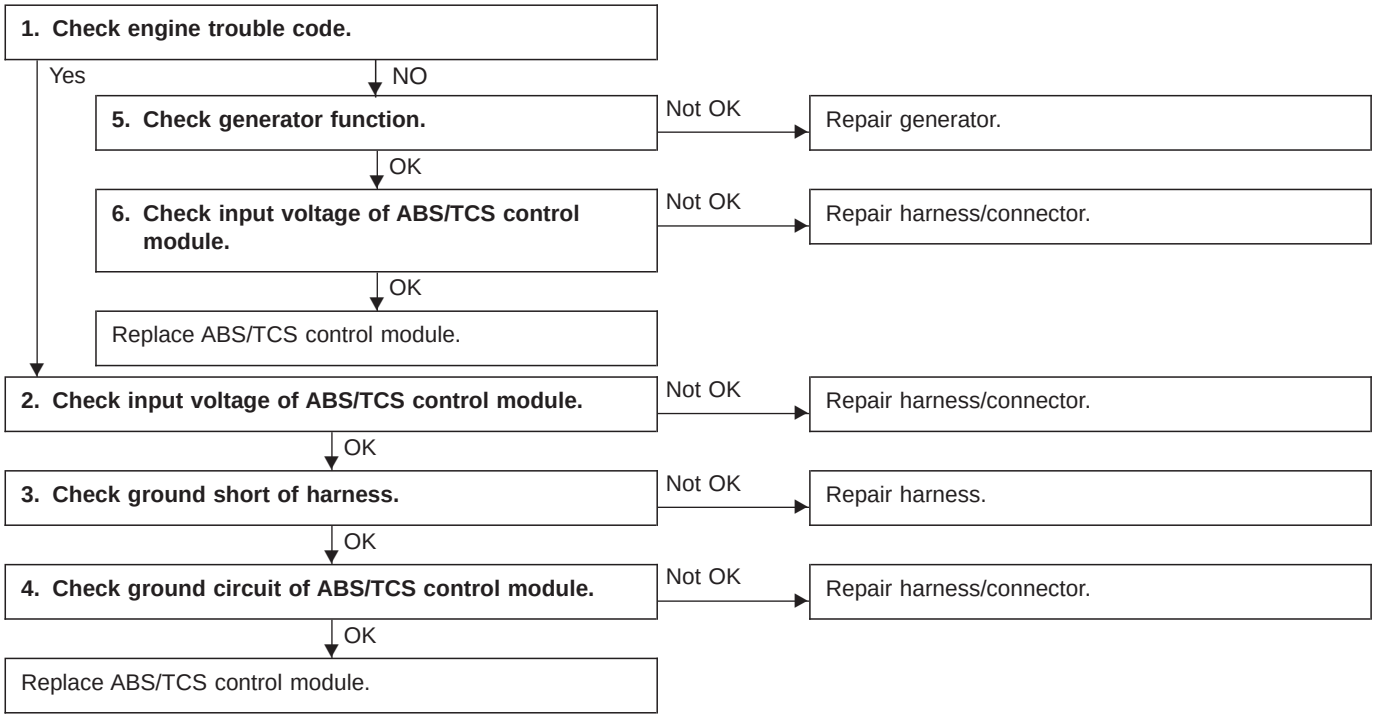
L: TROUBLE CODE 57 — FAULTY FLUID LEVEL SENSOR —

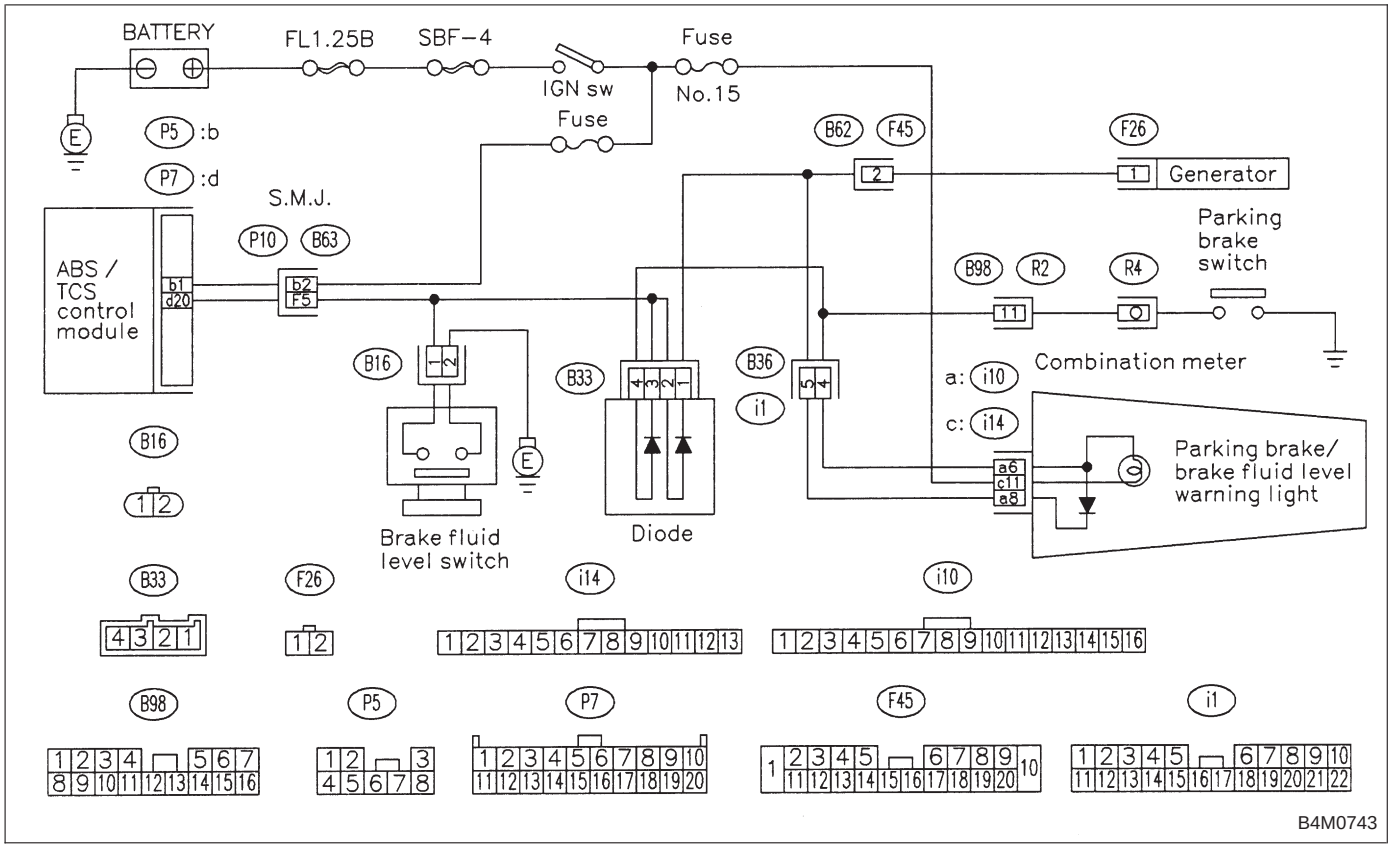
DIAGNOSIS:

- Faulty fluid level sensor circuit
- Faulty harness/connector
- Faulty ABS/TCS control module
- Faulty generator

TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.





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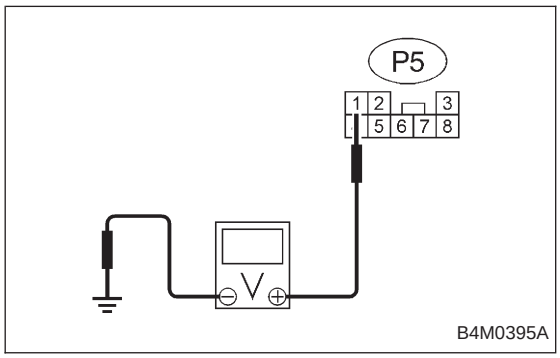
1. CHECK ENGINE TROUBLE CODE.

1) Read out engine trouble code.
2) Is trouble code 39 in memory?



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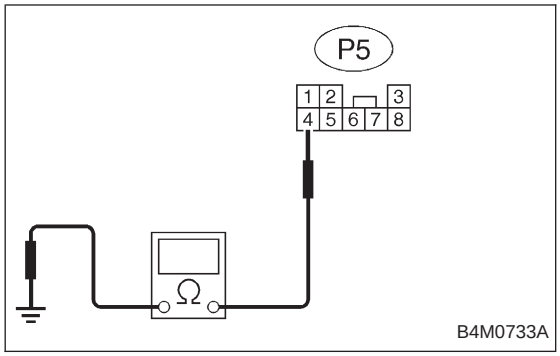
2. CHECK INPUT VOLTAGE OF ABS/TCS CONTROL MODULE.

1) Turn ignition switch OFF.
2) Disconnect ABS/TCS control module connectors.
3) Turn ignition switch ON, while engine is idling.
4) Measure voltage between ABS/TCS control module connector and body.

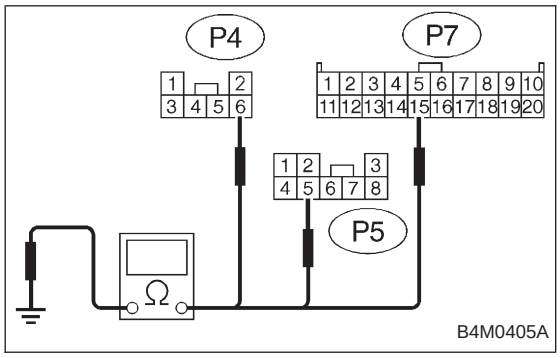
Connector & terminal / Specified voltage:
(P5) No. 1 — body / 14.5±0.3 V



3. CHECK GROUND SHORT OF HARNESS.

1) Turn ignition switch OFF.
2) Remove No. 18 fuse from fuse and joint box.
3) Disconnect ABS/TCS control module connectors.
4) Measure resistance between ABS/TCS control module connector and body.

Connector & terminal / Specified resistance:
(P5) No. 1 — body / 1 MΩ or more



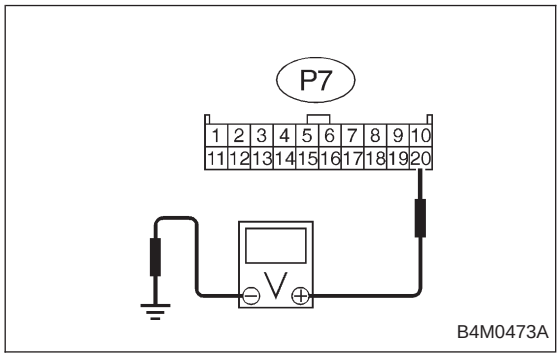
4. CHECK GROUND CIRCUIT OF ABS/TCS CONTROL MODULE.

1) Turn ignition switch OFF.
2) Disconnect connector from ABS/TCS control module.
3) Measure resistance between ABS/TCS control module connector and body.

Connector & terminal / Specified resistance:
(P4) No. 6 — body / 1 Ω or less
(P5) No. 5 — body / 1 Ω or less
(P7) No. 15 — body / 1 Ω or less

5. CHECK GENERATOR FUNCTION.

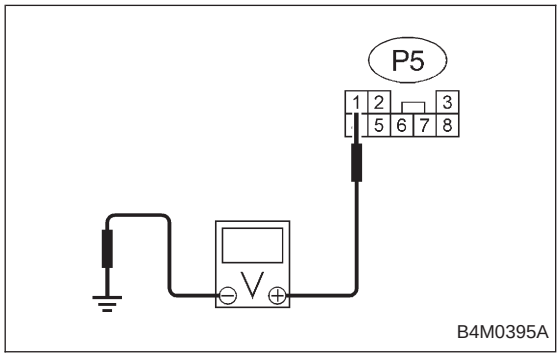
1) When the ignition key is at OFF, check the charge warning light is off.
2) Turn the key ON and ensure the light comes on.
3) Keep the engine running at idle and ensure the light goes off.



6. CHECK INPUT VOLTAGE OF ABS/TCS CONTROL MODULE.

1) Turn ignition switch OFF.
2) Disconnect ABS/TCS control module connectors.
3) Turn ignition switch ON.
4) Measure voltage between ABS/TCS control module connector and body.

Connector & terminal / Specified voltage:
(P7) No. 20 — body / 2 V or less (Engine OFF)
(P7) No. 20 — body / 10 — 14 V (Engine idling)
(P5) No. 1 — body / 10 — 13 V (Engine OFF)



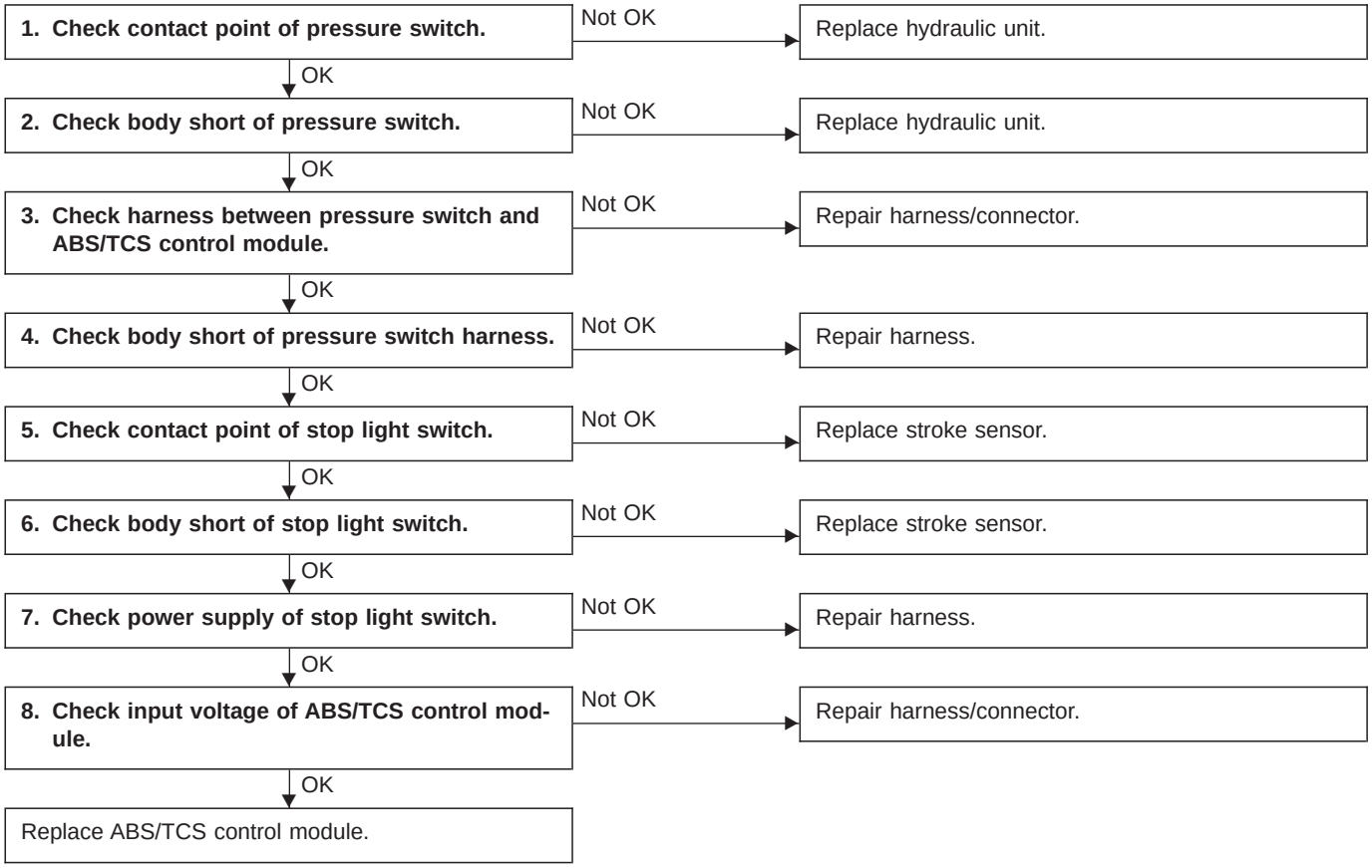
M: TROUBLE CODE 58 — FAULTY PRESSURE SWITCH —

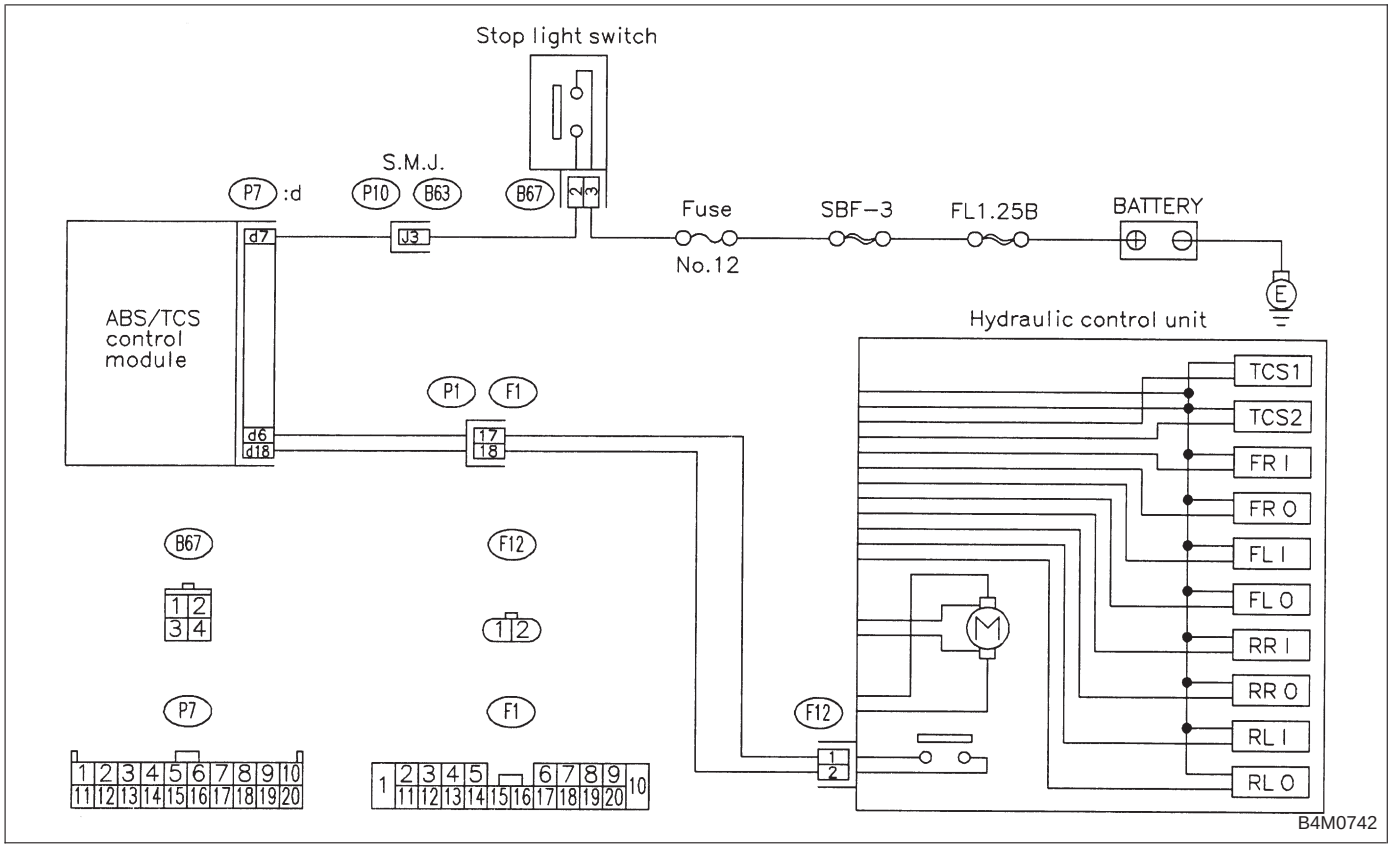
DIAGNOSIS:

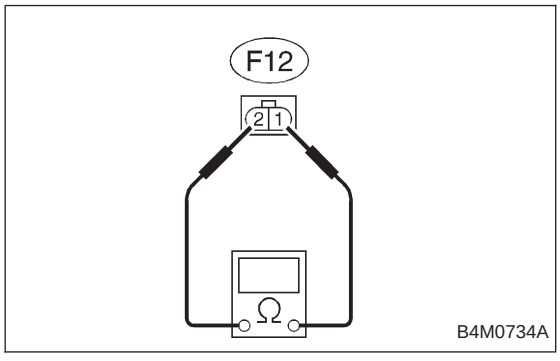
- Faulty pressure switch
- Faulty stop light switch
- Faulty harness/connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- TCS does not operate.



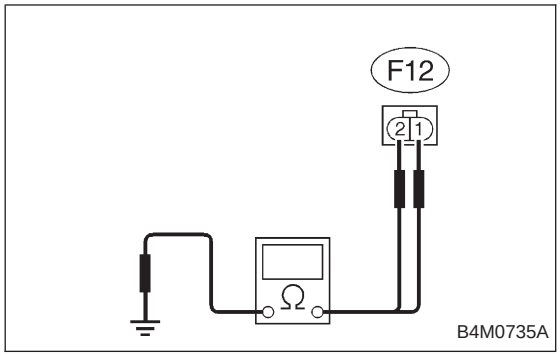




1. CHECK CONTACT POINT OF PRESSURE SWITCH.

1) Turn ignition switch OFF.
2) Disconnect hydraulic unit connector.
3) Measure resistance between hydraulic unit connector terminals.

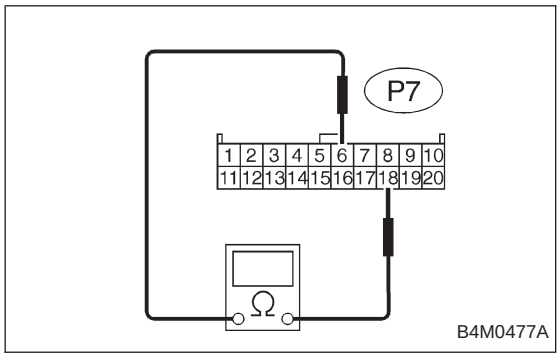
Connector & terminal / Specified resistance:
(F12) No. 1 — No. 2 / 1 MΩ or more (With brake pedal depressed)
(F12) No. 1 — No. 2 / 1 Ω or less (Without brake pedal depressed)



2. CHECK BODY SHORT OF PRESSURE SWITCH.

1) Turn ignition switch OFF.
2) Disconnect hydraulic unit connector.
3) Measure resistance between hydraulic unit connector and body.

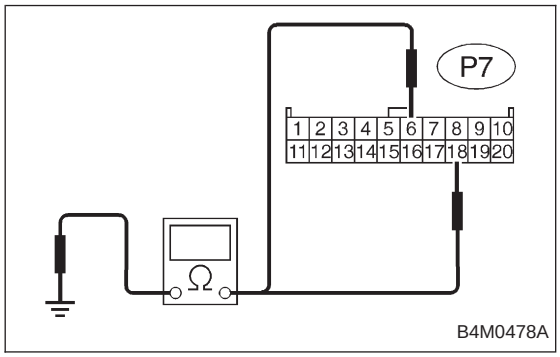
Connector & terminal / Specified resistance:
(F12) No. 1 — body / 1 MΩ or more
(F12) No. 2 — body / 1 MΩ or more



3. CHECK HARNESS BETWEEN PRESSURE SWITCH AND ABS/TCS CONTROL MODULE.

1) Turn ignition switch OFF.
2) Connect hydraulic unit connector.
3) Disconnect ABS/TCS control module connector.
4) Measure resistance between ABS/TCS control module connector terminals.

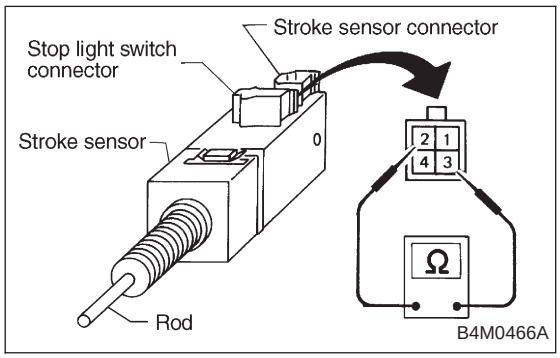
Connector & terminal / Specified resistance:
(P7) No. 6 — No. 18 / 1 MΩ or more (With brake pedal depressed)
(P7) No. 6 — No. 18 / 1 Ω or less (Without brake pedal depressed)



4. CHECK BODY SHORT OF PRESSURE SWITCH HARNESS.

1) Turn ignition switch OFF.
2) Disconnect ABS/TCS control module connector.
3) Measure resistance between ABS/TCS control module connector and body.

Connector & terminal / Specified resistance:
(P7) No. 6 — body / 1 MΩ or more
(P7) No. 18 — body / 1 MΩ or more



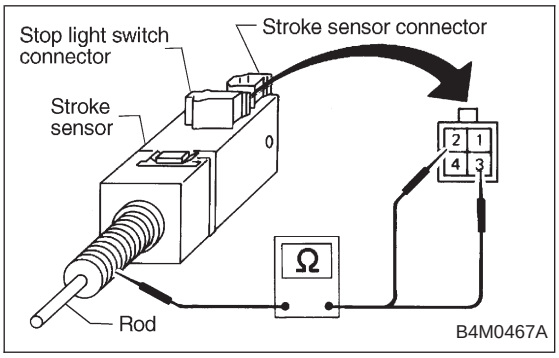
5. CHECK CONTACT POINT OF STOP LIGHT SWITCH.

1) Turn ignition switch OFF.
2) Disconnect stop light switch connectors.
3) Remove stroke sensor.
4) Measure resistance between stroke sensor terminals.

Terminal:
No. 2 — No. 3

Stroke Unit: mm (in)	Specified resistance
0 — 2.2±1.0 (0 — 0.087±0.039)	1 MΩ or more
2.2±1.0 — 18.0±0.5 (0.087±0.039 — 0.709±0.020)	1 Ω or less

NOTE:
Stroke = 0 when the rod is completely drawn in.

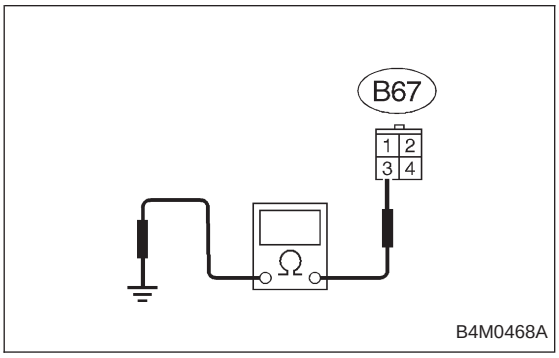


B4M0467A

6. CHECK BODY SHORT OF STOP LIGHT SWITCH.

1) Turn ignition switch OFF.
2) Disconnect stroke sensor connectors.
3) Remove stroke sensor.
4) Measure resistance between stroke sensor terminal and stroke sensor threads.

Terminal / Specified resistance:
No. 2 — stroke sensor threads / 1 MΩ or more
No. 3 — stroke sensor threads / 1 MΩ or more

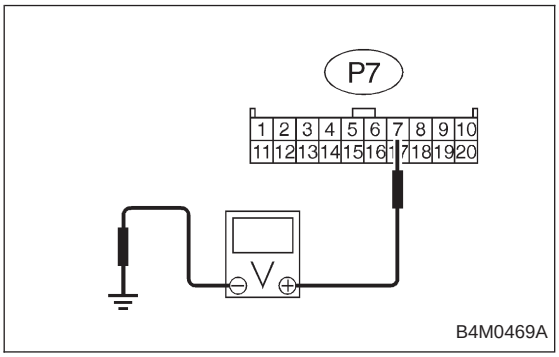


B4M0468A

7. CHECK POWER SUPPLY OF STOP LIGHT SWITCH.

1) Turn ignition switch OFF.
2) Disconnect stroke sensor connector.
3) Measure voltage between stroke sensor connector and body.

Connector & terminal / Specified voltage:
(B67) No. 3 — body / 10 — 13 V

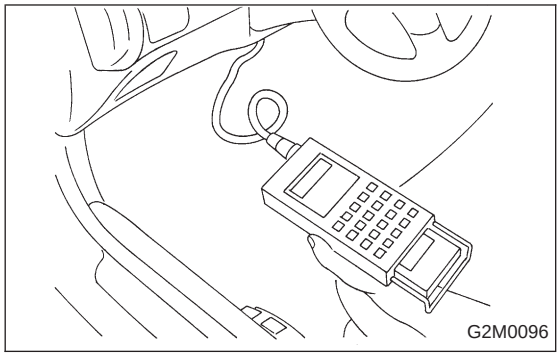


B4M0469A

8. CHECK INPUT VOLTAGE OF ABS/TCS CONTROL MODULE.

1) Turn ignition switch OFF.
2) Install stroke sensor.
3) Connect stroke sensor connector.
4) Disconnect ABS/TCS control module connector.
5) Measure voltage between ABS/TCS control module connector and body.

Connector & terminal / Specified voltage:
(P7) No. 7 — body / 10 — 13 V (With brake pedal depressed)
(P7) No. 7 — body / 0 V (Without brake pedal depressed)



9. Select Monitor Function Mode

Applicable cartridge of select monitor: No. 498349601

A: LIST OF FUNCTION MODE

1. F MODE (ROM ID, ANALOG DATA ARE DISPLAYED.)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to 4-4b
Code	Abbreviation				
F00	ROM	ECM identification	ROM ID number of ECM is read and enabled communication state is displayed.	Possible	[T9B0]
F01	FR	FR wheel speed (mile/h)	Wheel speed detected by the FR wheel speed sensor is displayed in mile/h.	Possible	[T9C0]
F02	FL	FL wheel speed (mile/h)	Wheel speed detected by the FL wheel speed sensor is displayed in mile/h.	Possible	[T9D0]
F03	RR	RR wheel speed (mile/h)	Wheel speed detected by the RR wheel speed sensor is displayed in mile/h.	Possible	[T9E0]
F04	RL	RL wheel speed (mile/h)	Wheel speed detected by the RL wheel speed sensor is displayed in mile/h.	Possible	[T9F0]
F05	FR	FR wheel speed (km/h)	Wheel speed detected by the FR wheel speed sensor is displayed in km/h.	Possible	[T9C0]
F06	FL	FL wheel speed (km/h)	Wheel speed detected by the FL wheel speed sensor is displayed in km/h.	Possible	[T9D0]
F07	RR	RR wheel speed (km/h)	Wheel speed detected by the RR wheel speed sensor is displayed in km/h.	Possible	[T9E0]
F08	RL	RL wheel speed (km/h)	Wheel speed detected by the RL wheel speed sensor is displayed in km/h.	Possible	[T9F0]
F09	PSS	Pedal stroke sensor output	The number of output steps of the pedal stroke sensor is displayed.	Possible	[T9G0]

2. FA MODE (ON/OFF DATA ARE DISPLAYED.)

If the system is in normal condition with the engine run at idle speed (when the brake pedal is off), the LED of EC (AEC signal) of FA2 will come on, the LED of EM (EAM signal) blink and all other LED's go out.

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to 4-4b
Code	Abbreviation				
FA0	OF	OFF.SW	LED 1 comes on with the OFF switch on.	Possible	[T9H0]
	B1	Stop light switch	LED 2 comes on with the switch on (with the brake pedal down).		
	VR	Valve relay signal	LED 3 comes on with the valve relay off.		
	VM	Valve relay monitor	LED 4 comes on with the valve relay off.		
	MR	Motor relay signal	LED 5 comes on with the motor on.		
	MS	Motor sensor	LED 6 comes on with the motor on.		
	FS	Fluid level sensor	LED 7 comes on with the sensor on (the fluid level is lowered).		
FA1	FI	FR.IN valve	LED 1 comes on when the FR.IN valve is operating.	Possible	[T9I0]
	RO	FR.OUT valve	LED 2 comes on when the FR.OUT valve is operating.		
	FL	FL.IN valve	LED 3 comes on when the FL.IN valve is operating.		
	LO	FL.OUT valve	LED 4 comes on when the FL.OUT valve is operating.		
	T1	TCS1 valve	LED 5 comes on when the TCS1 valve is operating.		
	RI	RR.IN valve	LED 6 comes on when the RR.IN valve is operating.		
	RO	RR.OUT valve	LED 7 comes on when the RR.OUT valve is operating.		
	RI	RL.IN valve	LED 8 comes on when the RL.IN valve is operating.		
	LO	RL.OUT valve	LED 9 comes on when the RL.OUT valve is operating.		
	T2	TCS2 valve	LED 10 comes on when the TCS2 valve is operating.		
FA2	AW	ABS warning light	LED 1 comes on when the warning light is on.	Possible	[T9J0]
	TW	TCS warning light	LED 2 comes on when the warning light is on.		
	TO	TCS OFF indicator light	LED 3 comes on when the indicator light is on.		
	TI	TCS operation indicator light	LED 4 comes on when the indicator light is on.		
	EC	AEC signal	With the engine run at idle speed, LED 6 (AEC) comes on and LED 7 (AEB) goes out (They go on and off depending on the behavior of a vehicle.)		
	EB	AEB signal			
	ET	AET signal	LED 8 comes on with the TCS control on.		
	EM	EAM signal	LED 9 comes on or blinks when the engine control is enabled.		
	AT	AAT signal	LED 10 comes on when ABS control is on.		

3. FB MODE (TROUBLE CODES ARE DISPLAYED.)

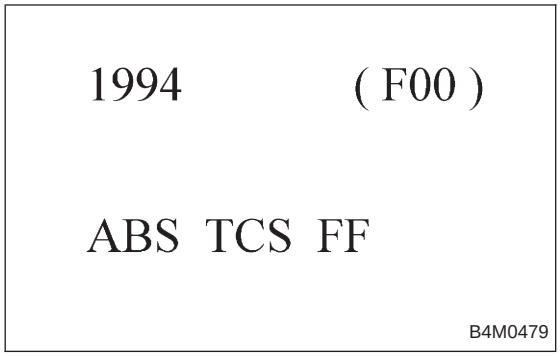
Function code		Measuring items	Contents to be monitored	Scroll	Ref. to 4-4b
Code	Abbreviation				
FB0	D·NEW	The most recent failures are displayed.	Trouble codes, trouble spots and symptoms for the most recent failure are displayed.	Possible	[T10B0]
FB1	D·ALL	Historical troubles are displayed.	Trouble codes, trouble spots and symptoms for all historical failures are displayed.	Possible	[T10B0]

4. FC MODE (TROUBLE CODES ARE ERASED.)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to 4-4b
Code	Abbreviation				
FC0	D·CLR	Trouble codes are erased.	Function of clearing trouble code stored in memory.	Possible	[T9K0]

5. FD MODE (SEQUENCE CHECK AND AIR RELEASE MODE)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FD1	A·CHK	ABS sequence control	Perform ABS sequence control by operating valve and pump motor sequentially.	Impossible	4-4 [W20D0]
FD2	T·CHK	TCS sequence control	Perform TCS sequence control by operating the valve and pump motor sequentially.	Impossible	4-4 [W20F0]
FD3	AIR	Air bleeding control	Manually operate the valve and pump motor to bleed air.	Impossible	4-4 [W19A0]



B: MODE F00 — ROM ID NUMBER (ROM) —

CONDITION:

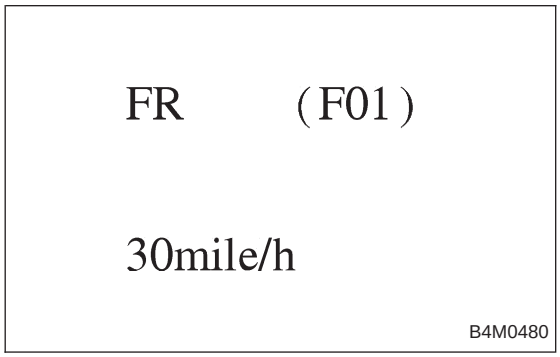
Ignition switch ON

SPECIFIED DATA:

Presentation display

- Probable cause (Item outside “specified data”)

1. Error 1	Check for loose or disconnected connector, and discontinued circuit, etc.
2. Error 2	Check for poor contact of cartridge, or different type cartridge.

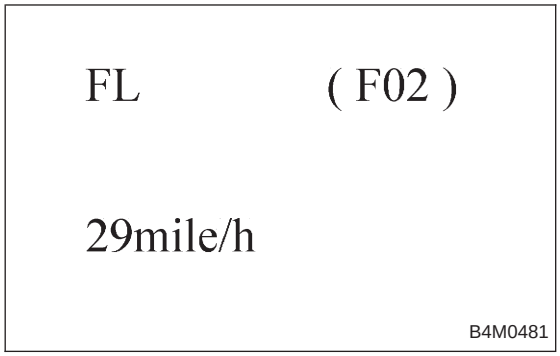


C: MODE F01 AND F05 — FRONT RIGHT WHEEL SPEED SIGNAL (FR) —

- Compare speedometer with monitor indications.
- F01: FR wheel speed is indicated in mile per hour (mile/h).
- F05: FR wheel speed is indicated in kilometer per hour (km/h).

NOTE:

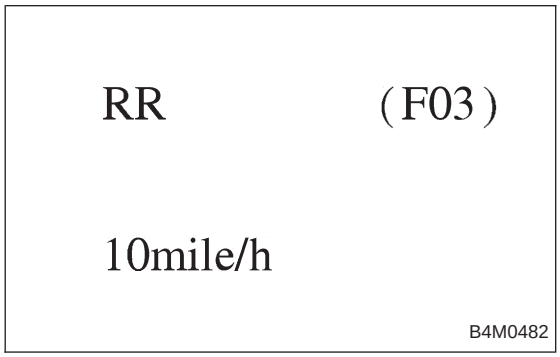
The monitor as shown, indicates that FR wheel speed is 30 mile/h.



D: MODE F02 AND F06 — FRONT LEFT WHEEL SPEED SIGNAL (FL) —

- Compare speedometer with monitor indications.
- F02: FL wheel speed is indicated in mile per hour (mile/h).
- F06: FL wheel speed is indicated in kilometer per hour (km/h).

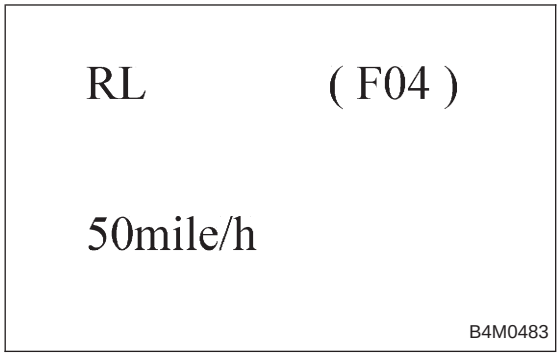
NOTE:
The monitor as shown, indicates that FL wheel speed is 29 mile/h.



E: MODE F03 AND F07 — REAR RIGHT WHEEL SPEED SIGNAL (RR) —

- Compare speedometer with monitor indications.
- F03: RR wheel speed is indicated in mile per hour (mile/h).
- F07: RR wheel speed is indicated in kilometer per hour (km/h).

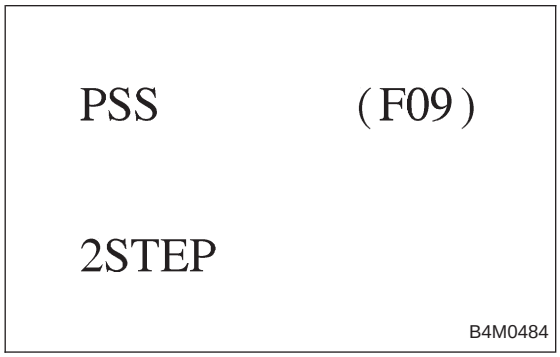
NOTE:
The monitor as shown, indicates that RR wheel speed is 10 mile/h.



F: MODE F04 AND F08 — REAR LEFT WHEEL SPEED SIGNAL (RL) —

- Compare speedometer with monitor indications.
- F04: RL wheel speed is indicated in mile per hour (mile/h).
- F08: RL wheel speed is indicated in kilometer per hour (km/h).

NOTE:
The monitor as shown, indicates that RL wheel speed is 50 mile/h.



G: MODE F09 — PEDAL STROKE SENSOR SIGNAL (PSS) —

- Indicates the output step number of the pedal stroke sensor.

LED No.	Signal name	Display
1	TCS OFF switch	OF
2	Stop light switch	B1
3	Valve relay signal	VR
4	Valve relay monitor	VM
5	Motor relay signal	MR
6	Motor sensor	MS
7	Brake fluid level sensor	FS
8	—	—
9	—	—
10	—	—

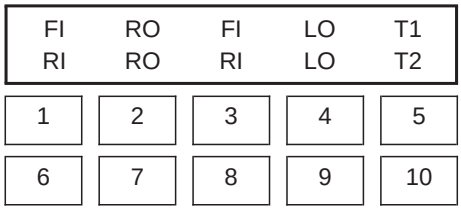
OF MS	B1 FS	VR —	VM —	MR —
1	2	3	4	5
6	7	8	9	10

H: MODE FA0 — ON ↔ OFF SIGNAL —

Requirement for LED “ON”

LED No. 1 T.C.S OFF switch is turned ON.
LED No. 2 Stop light switch is turned ON. (With brake pedal depressed.)
LED No. 3 Valve relay is turned OFF.
LED No. 4 Valve relay is turned OFF.
LED No. 5 Motor relay is turned ON.
LED No. 6 Motor is rotating.
LED No. 7 Brake fluid level sensor is turned ON. (Brake fluid is insufficient.)

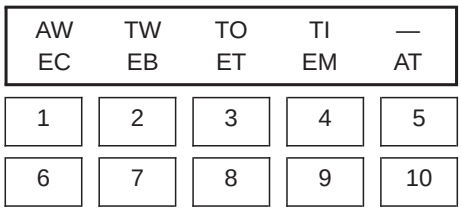
LED No.	Signal name	Display
1	Front right inlet solenoid valve	FI
2	Front right outlet solenoid valve	RO
3	Front left inlet solenoid valve	FI
4	Front left outlet solenoid valve	LO
5	Traction control solenoid valve 1	T1
6	Rear right inlet solenoid valve	RI
7	Rear right outlet solenoid valve	RO
8	Rear left inlet solenoid valve	RI
9	Rear left outlet solenoid valve	LO
10	Traction control solenoid valve 2	T2



I: MODE FA1 — ON ↔ OFF SIGNAL —

Requirement for LED “ON”
LED No. 1 Front right inlet solenoid valve is in function.
LED No. 2 Front right outlet solenoid valve is in function.
LED No. 3 Front left inlet solenoid valve is in function.
LED No. 4 Front left outlet solenoid valve is in function.
LED No. 5 Traction control solenoid valve 1 is in function.
LED No. 6 Rear right inlet solenoid valve is in function.
LED No. 7 Rear right outlet solenoid valve is in function.
LED No. 8 Rear left inlet solenoid valve is in function.
LED No. 9 Rear left outlet solenoid valve is in function.
LED No. 10 Traction control solenoid valve 2 is in function.

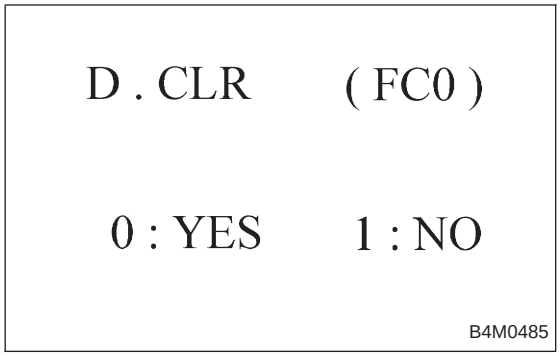
LED No.	Signal name	Display
1	ABS warning light	AW
2	TCS warning light	TW
3	TCS OFF indicator light	TO
4	TCS operating indicator light	TI
5	—	—
6	AEC signal	EC
7	AEB signal	EB
8	AET signal	ET
9	EAM signal	EM
10	AAT signal	AT



J: MODE FA2 — ON ↔ OFF SIGNAL —

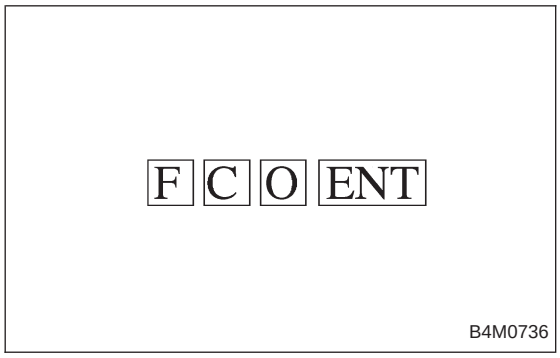
Requirement for LED “ON”
LED No. 1 ABS warning light is on.
LED No. 2 TCS warning light is on.
LED No. 3 TCS OFF indicator light is on.
LED No. 4 TCS operating indicator light is on.
LED No. 6 Engine is running at idle. (LED comes on or goes off depending on vehicle movement.)
LED No. 7 Engine is running at idle. (LED comes on or goes off depending on vehicle movement.)
LED No. 8 TCS control operates.
LED No. 9 Engine control is permitted.
LED No. 10 ABS control operates.

NOTE:
If the system is normal when idling the engine without depressing brake pedal, LED No. 6 comes on, LED No. 9 blinks and all other LED’s are off.

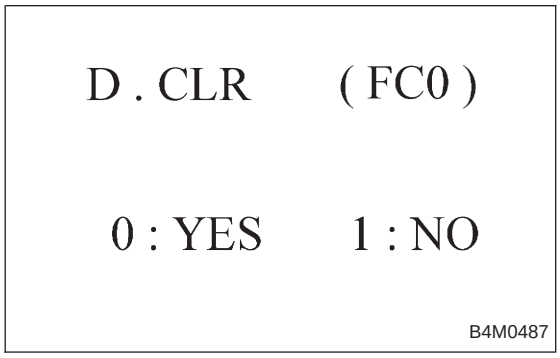


K: MODE FC0
— CLEAR MEMORY MODE (D·CLR) —

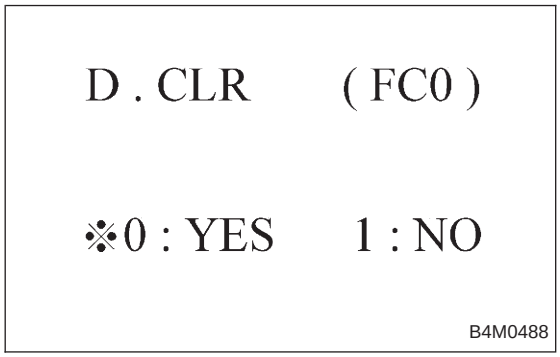
● Deletes the recorded trouble codes in ABS/TCS control module.



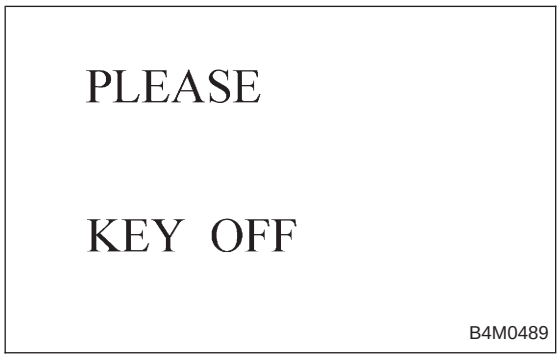
1) Use function keys to put in F C O ENT.



2) System indicates as shown.



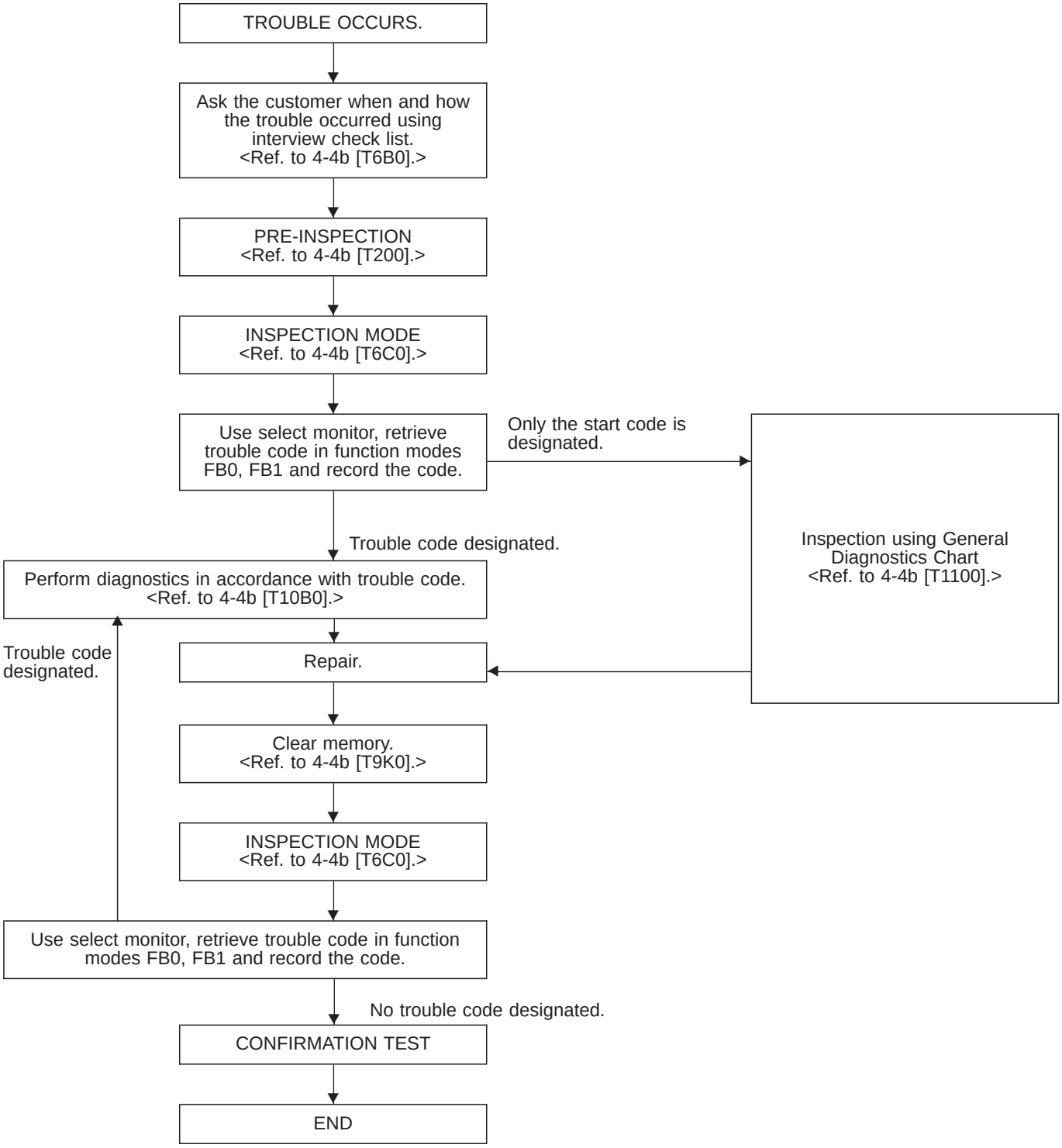
3) Key in 0, to clear memories. The indication of ※ is added to screen.



4) Key in ENT. System indicates as shown.
5) Turn the key OFF.

10. Diagnostic Chart with Select Monitor

A: BASIC DIAGNOSTIC CHART



NOTE:
To check harness for broken wires or short circuits, shake it while holding it or the connector.

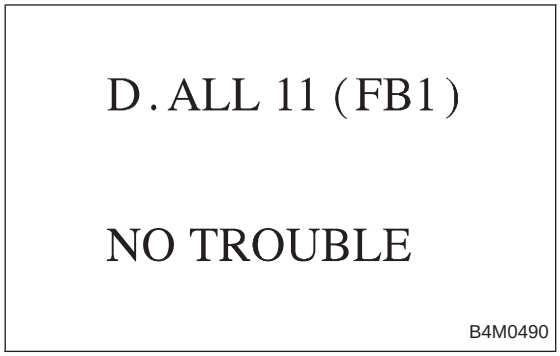
B: LIST OF TROUBLE CODE

Diagnostic items (select monitor FB0)	Code	Display screen (FB0)	Diagnostic items (select monitor FB1)	Display screen (FB1)	Ref. to 4-4b
Normal	11	NO TROUBLE	Normal	NO TROUBLE	[T10C0]
Detection of FR sensor hardware	21	FR.SS HARD	Open circuit of FR sensor	FR.SS OPEN	[T10D1]
			Short circuit of FR sensor	FR.SS SHORT	[T10D2]
Detection of FR sensor software	22	FR.SS SOFT	FR sensor, variations in wheel speed	FR.SS W.SPEED	[T10E1]
			FR sensor, reduced pressure mode	FR.SS OR MV	[T10E2]
			FR sensor, wheel speed higher than prescribed	FR.SS OVER	[T10E3]
Detection of FL sensor hardware	23	FL.SS HARD	Open circuit of FL sensor	FL.SS OPEN	[T10F1]
			Short circuit of FL sensor	FL.SS SHORT	[T10F2]
Detection of FL sensor software	24	FL.SS SOFT	FL sensor, variations in wheel speed	FL.SS W.SPEED	[T10G1]
			FL sensor, reduced pressure mode	FL.SS OR MV	[T10G2]
			FL sensor, wheel speed higher than prescribed	FL.SS OVER	[T10G3]
Detection of RR sensor hardware	25	RR.SS HARD	Open circuit of RR sensor	RR.SS OPEN	[T10H1]
			Short circuit of RR sensor	RR.SS SHORT	[T10H2]
Detection of RR sensor software	26	RR.SS SOFT	RR sensor, variations in wheel speed	RR.SS W.SPEED	[T10I1]
			RR sensor, reduced pressure mode	RR.SS OR MV	[T10I2]
			RR sensor, wheel speed higher than prescribed	RR.SS OVER	[T10I3]
Detection of RL sensor hardware	27	RL.SS HARD	Open circuit of RL sensor	RL.SS OPEN	[T10J1]
			Short circuit of RL sensor	RL.SS SHORT	[T10J2]
Detection of RL sensor software	28	RL.SS SOFT	RL sensor, variations in wheel speed	RL.SS W.SPEED	[T10K1]
			RL sensor, reduced pressure mode	RL.SS OR MV	[T10K2]
			RL sensor, wheel speed higher than prescribed	RL.SS OVER	[T10K3]
Abnormal FR.IN valve	31	FR.IN VALVE	Abnormal FR.IN valve	FR.IN VALVE	[T10L0]
Abnormal FR.OUT valve	32	FR.OUT VALVE	Abnormal FR.OUT valve	FR.OUT VALVE	[T10M0]
Abnormal FL.IN valve	33	FL.IN VALVE	Abnormal FL.IN valve	FL.IN VALVE	[T10N0]
Abnormal FL.OUT valve	34	FL.OUT VALVE	Abnormal FL.OUT valve	FL.OUT VALVE	[T10O0]
Abnormal RR.IN valve	35	RR.IN VALVE	Abnormal RR.IN valve	RR.IN VALVE	[T10P0]
Abnormal RR.OUT valve	36	RR.OUT VALVE	Abnormal RR.OUT valve	RR.OUT VALVE	[T10Q0]
Abnormal RL.IN valve	37	RL.IN VALVE	Abnormal RL.IN valve	RL.IN VALVE	[T10R0]
Abnormal RL.OUT valve	38	RL.OUT VALVE	Abnormal RL.OUT valve	RL.OUT VALVE	[T10S0]
Abnormal ECM	41	ECU	Abnormal ECM	ECU	[T10T0]
Abnormal line voltage	42	HIGH VOLTAGE	Abnormal line voltage	HIGH VOLTAGE	[T10U0]
Abnormal EGI communication line	43	EGI LINE	Abnormal EGI communication line	EGI LINE	[T10V0]
Abnormal valve relay	51	V.RELAY	Valve relay ON failure	V.RELAY ON	[T10W1]
			Valve relay OFF failure	V.RELAY OFF	[T10W2]
Abnormal motor system	52	MOTOR	Motor relay ON failure	MOTOR ON	[T10X1]
			Motor relay OFF failure	MOTOR OFF	[T10X2]

Diagnostic items (select monitor FB0)	Code	Display screen (FB0)	Diagnostic items (select monitor FB1)	Display screen (FB1)	Ref. to 4-4b
Abnormal stroke sensor and stop light switch	54	PSS & BLS	Open/short circuits of stroke sensor	B.SW HARD	[T10Y1]
			Comparison of stroke sensor and acceleration	B.SW SOFT(G)	[T10Y2]
			Comparison of stroke sensor and stop light switch	B.SW SOFT(B)	[T10Y3]
			Comparison of stroke sensor and pump	B.SW SOFT(P)	[T10Y4]
			Open circuit of stop light switch	B.SW SOFT(O)	[T10Y5]
Abnormal fluid level sensor line	57	FLUID LEVEL SS	Abnormal fluid level sensor line	FLUID LEVEL SS	[T10Z0]
Abnormal pressure switch	58	PRESSURE SW	Abnormal pressure switch	PRESSURE SW	[T10AA0]
Abnormal TCS1 valve	61	TCS1 VALVE	Abnormal TCS1 valve	TCS1 VALVE	[T10AB0]
Abnormal TCS2 valve	62	TCS2 VALVE	Abnormal TCS2 valve	TCS2 VALVE	[T10AC0]

1. IF THE SELECT MONITOR IS USED FOR TROUBLESHOOTING, IT IS ADVISED TO FOLLOW THE PROCEDURE BELOW

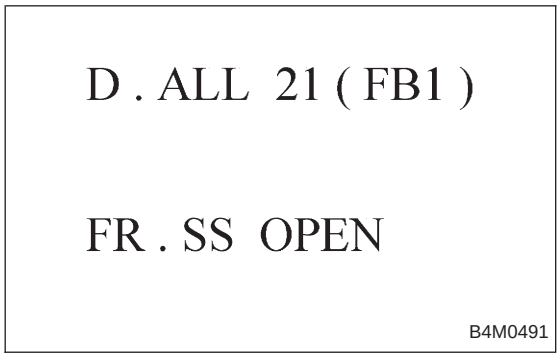
1) Activate function FB0 to read the most recent trouble code and record it.
2) Activate function FB1 to read all trouble codes and record them.
(If troubles occur in the wheel speed sensor, stop & brake switch, valve relay or motor system, detailed data on troubles are displayed by the FB1 function, allowing you to easily locate points where need repair.)
3) Perform troubleshooting mainly in the FB1 mode.



C: TROUBLE CODE 11
— NO TROUBLE —

DIAGNOSIS:

- ABS/TCS control module does not store troubles.



D: TROUBLE CODE 21

1. FR.SS OPEN

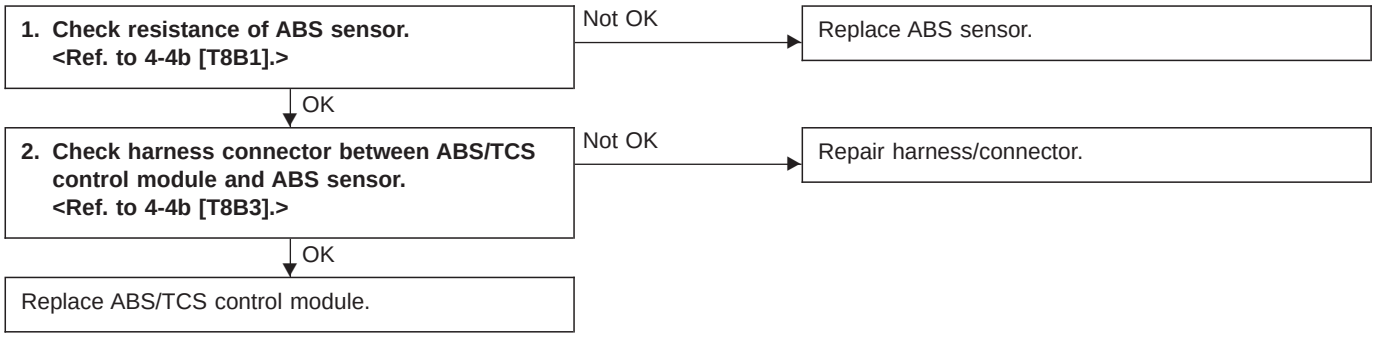
— Faulty front right ABS sensor (Open circuit) —

DIAGNOSIS:

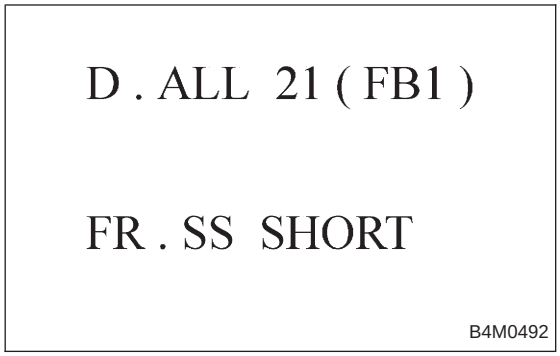
- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.



NOTE:
When checking ABS sensor, carefully bend or swing connector and harness to check for improper contacts or open circuits.



2. FR.SS SHORT

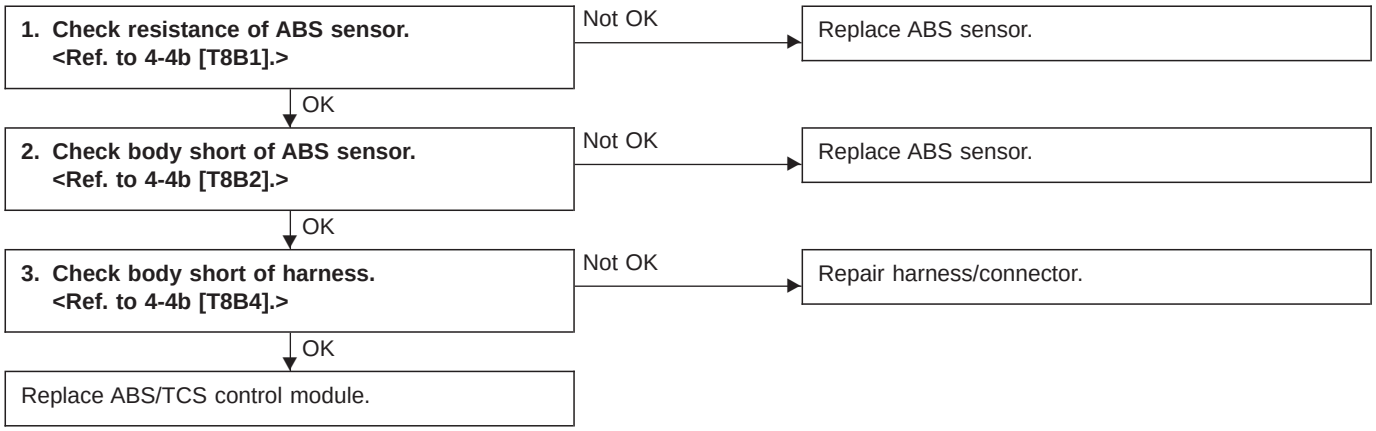
— Faulty front right ABS sensor (Short circuit) —

DIAGNOSIS:

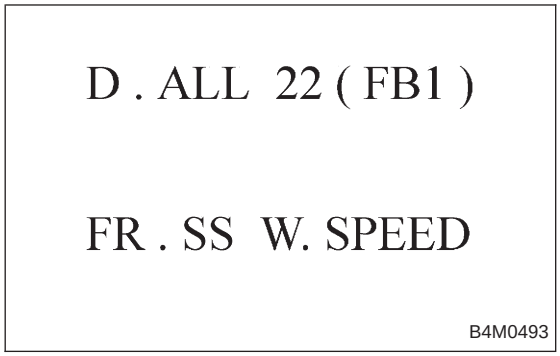
- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- TCS does not operate.



NOTE:
When checking ABS sensor, carefully bend or swing connector and harness to check for improper contacts or open circuits.



E: TROUBLE CODE 22

1. FR.SS W.SPEED

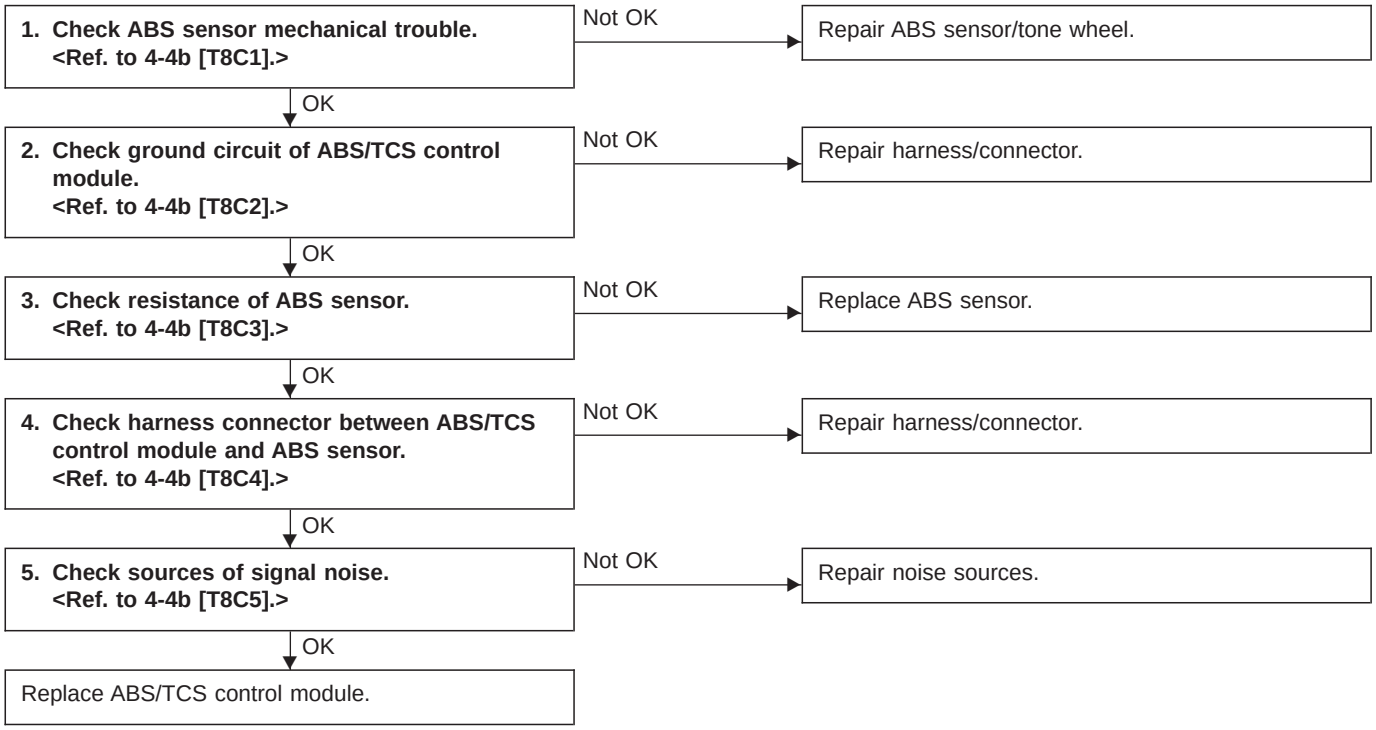
— Irregular signals from front right ABS sensor —

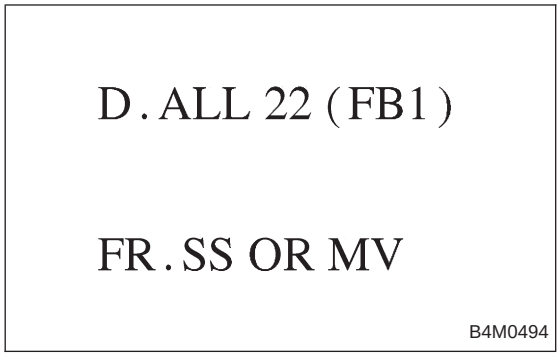
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.





2. FR.SS OR MV

— Irregular signals from front right ABS sensor in decompressing mode —

DIAGNOSIS:

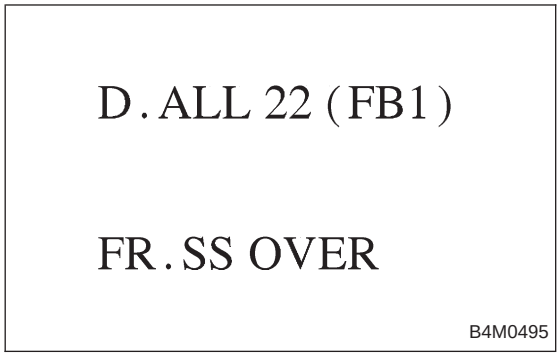
- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty hydraulic unit
- Faulty harness/connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.

1. **Check ABS sensor mechanical trouble.** **<Ref. to 4-4b [T8C1].>**
   - Not OK → Repair ABS sensor/tone wheel.
   - OK ↓
2. **Check ground circuit of ABS/TCS control module.** **<Ref. to 4-4b [T8C2].>**
   - Not OK → Repair harness/connector.
   - OK ↓
3. **Check sources of signal noise.** **<Ref. to 4-4b [T8C5].>**
   - Not OK → Repair noise sources.
   - OK ↓
4. **Check operation of hydraulic unit.** **<Ref. to 4-4b [T8C6].>**
   - Not OK → Replace hydraulic unit.
   - OK ↓

Replace ABS/TCS control module.



3. FR.SS OVER

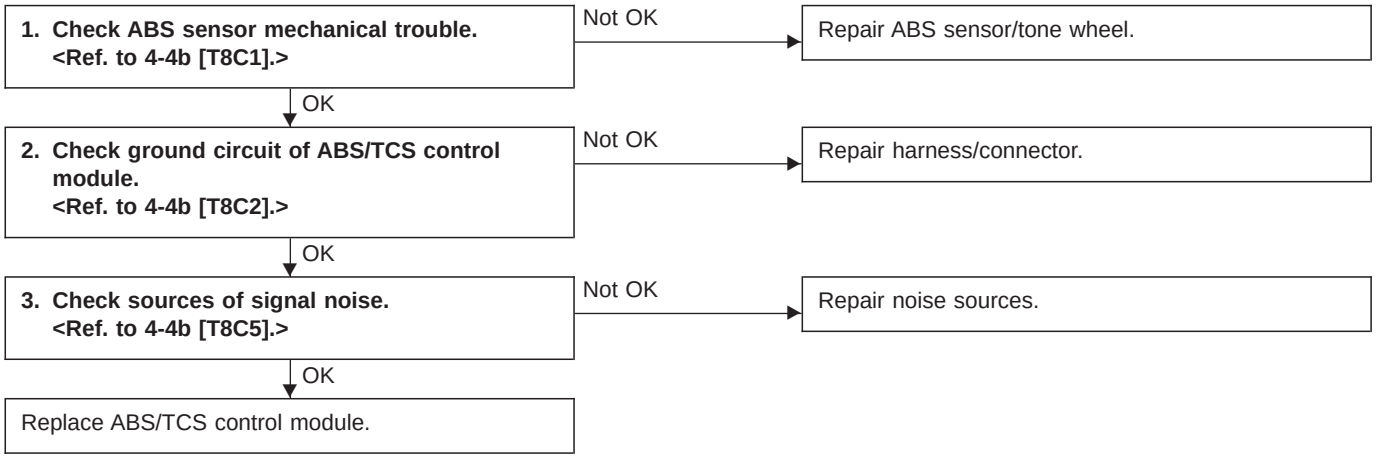
— Excessive speed of front right ABS sensor signal —

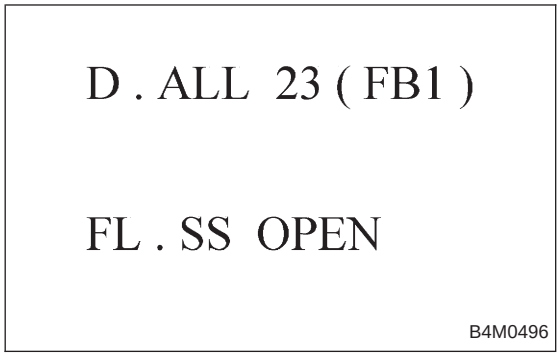
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.





F: TROUBLE CODE 23

1. FL.SS OPEN

— Faulty front left ABS sensor (Open circuit) —

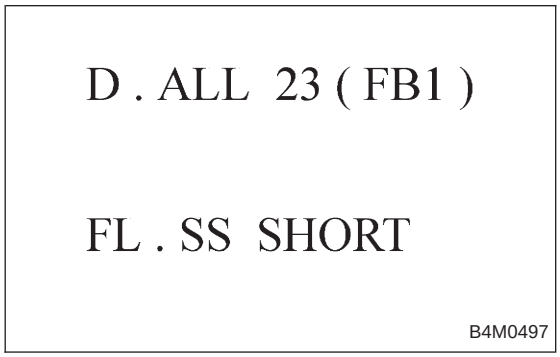
DIAGNOSIS:

- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
The procedures used are the same as those for FR.SS OPEN.
<Ref. to 4-4b [T10D1].>



2. FL.SS SHORT

— Faulty front left ABS sensor (Short circuit) —

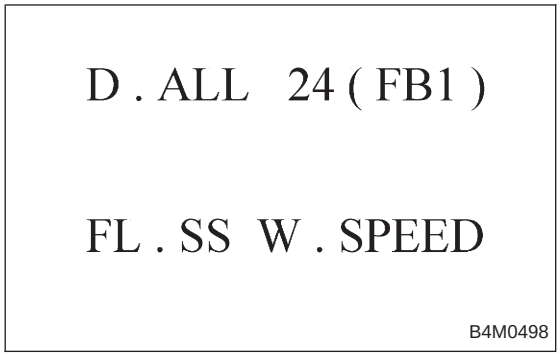
DIAGNOSIS:

- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
The procedures used are the same as those for FR.SS SHORT.
<Ref. to 4-4b [T10D2].>



G: TROUBLE CODE 24

1. FL.SS W.SPEED

— Irregular signals from front left ABS sensor —

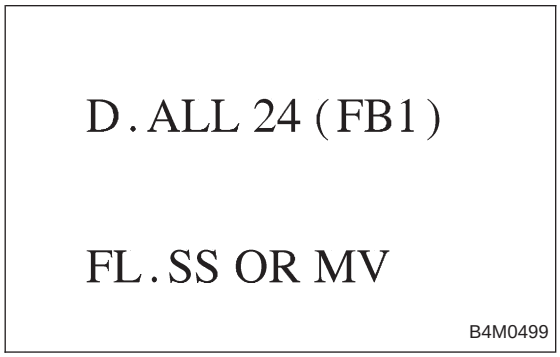
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
The procedures used are the same as those for FR.SS W.SPEED.
<Ref. to 4-4b [T10E1].>



2. FL.SS OR MV

— Irregular signals from front left ABS sensor in decompressing mode —

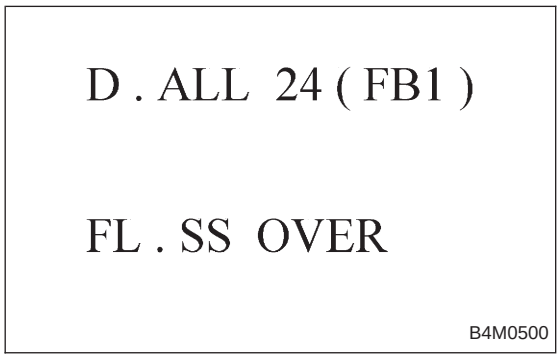
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty hydraulic unit
- Faulty harness/connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
The procedures used are the same as those for FR.SS OR MV.
<Ref. to 4-4b [T10E2].>



3. FL.SS OVER

— Excessive speed of front left ABS sensor signal —

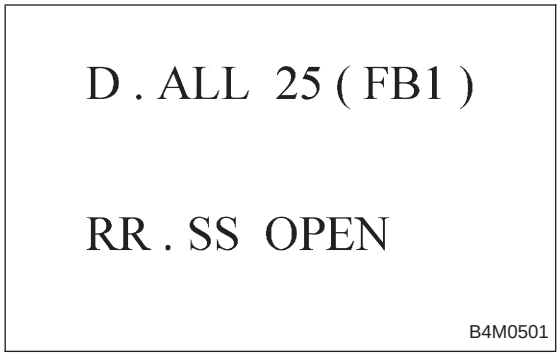
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
The procedures used are the same as those for FR.SS OVER.
<Ref. to 4-4b [T10E3].>



H: TROUBLE CODE 25

1. RR.SS OPEN

— Faulty rear right ABS sensor (Open circuit) —

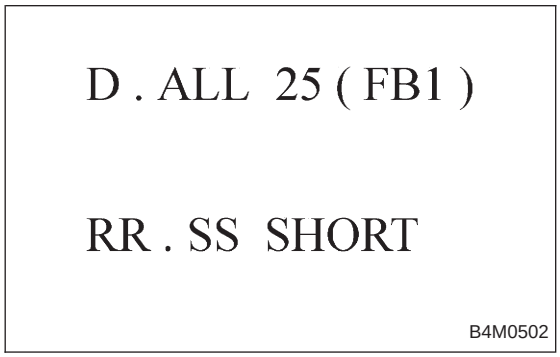
DIAGNOSIS:

- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
The procedures used are the same as those for FR.SS OPEN.
<Ref. to 4-4b [T10D1].>



2. RR.SS SHORT

— Faulty rear right ABS sensor (Short circuit) —

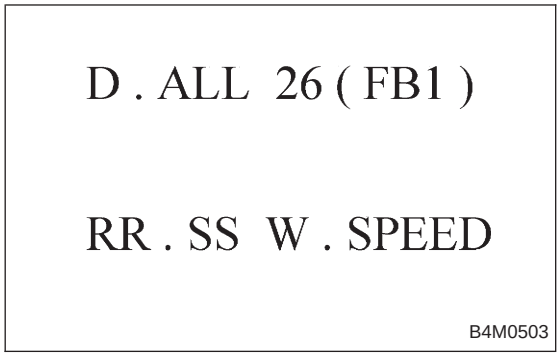
DIAGNOSIS:

- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
The procedures used are the same as those for FR.SS SHORT.
<Ref. to 4-4b [T10D2].>



I: TROUBLE CODE 26

1. RR.SS W.SPEED

— Irregular signals from rear right ABS sensor —

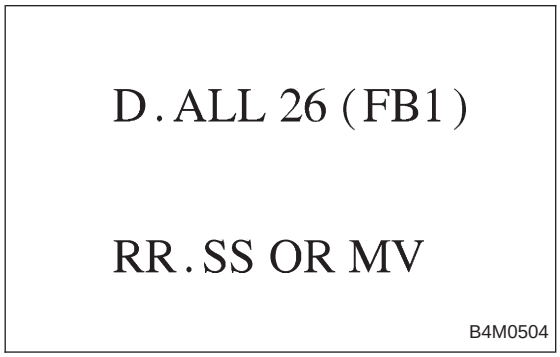
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
The procedures used are the same as those for FR.SS W.SPEED.
<Ref. to 4-4b [T10E1].>



2. RR.SS OR MV

— Irregular signals from rear right ABS sensor in decompressing mode —

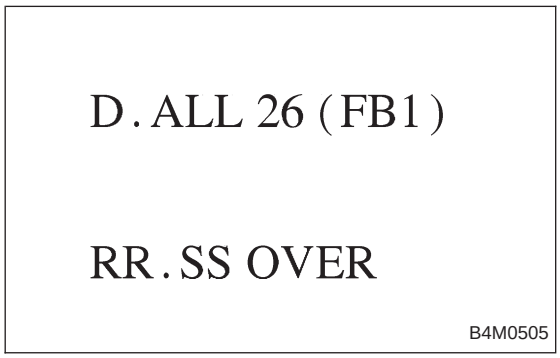
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty hydraulic unit
- Faulty harness/connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
The procedures used are the same as those for FR.SS OR MV.
<Ref. to 4-4b [T10E2].>



3. RR.SS OVER

— Excessive speed of rear right ABS sensor signal —

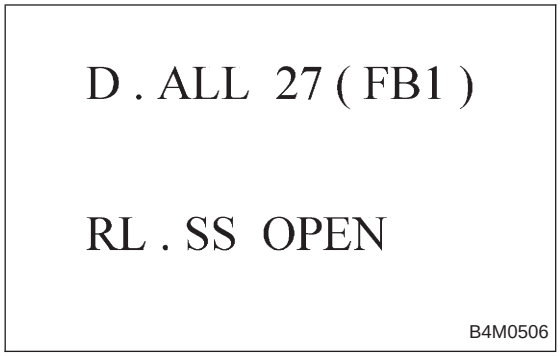
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
The procedures used are the same as those for FR.SS OVER.
<Ref. to 4-4b [T10E3].>



J: TROUBLE CODE 27

1. RL.SS OPEN

— Faulty rear left ABS sensor (Open circuit) —

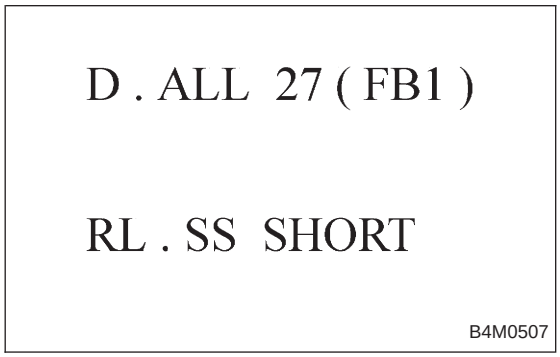
DIAGNOSIS:

- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
The procedures used are the same as those for FR.SS OPEN.
<Ref. to 4-4b [T10D1].>



2. RL.SS SHORT

— Faulty rear left ABS sensor (Short circuit) —

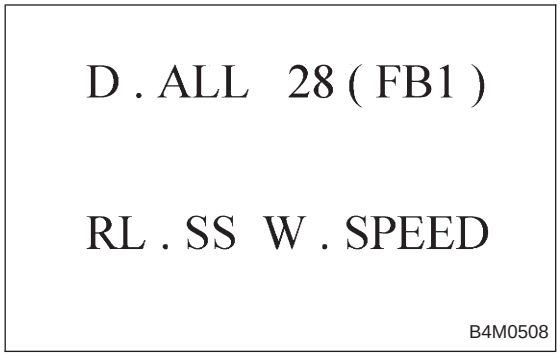
DIAGNOSIS:

- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
The procedures used are the same as those for FR.SS SHORT.
<Ref. to 4-4b [T10D2].>



K: TROUBLE CODE 28

1. RL.SS W.SPEED

— Irregular signals from rear left ABS sensor —

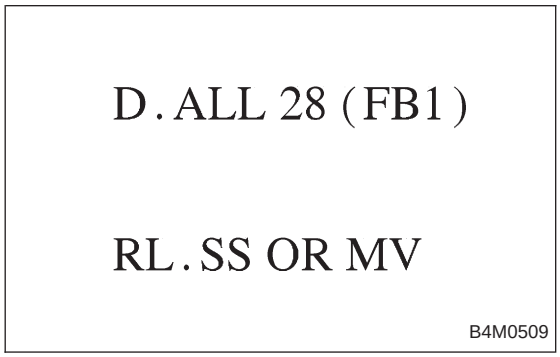
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
The procedures used are the same as those for FR.SS W.SPEED.
<Ref. to 4-4b [T10E1].>



2. RL.SS OR MV

— Irregular signals from rear left ABS sensor in decompressing mode —

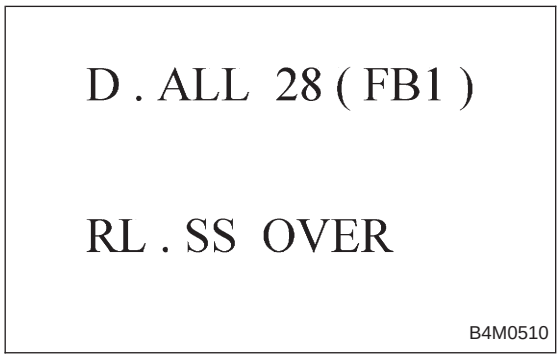
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty hydraulic unit
- Faulty harness/connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
The procedures used are the same as those for FR.SS OR MV.
<Ref. to 4-4b [T10E2].>



3. RL.SS OVER

— Excessive speed of rear left ABS sensor signal —

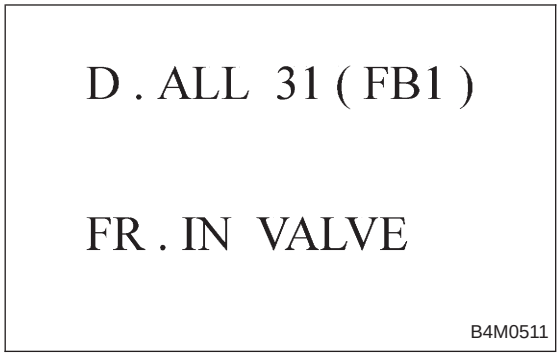
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
The procedures used are the same as those for FR.SS OVER.
<Ref. to 4-4b [T10E3].>



L: TROUBLE CODE 31

FR.IN VALVE

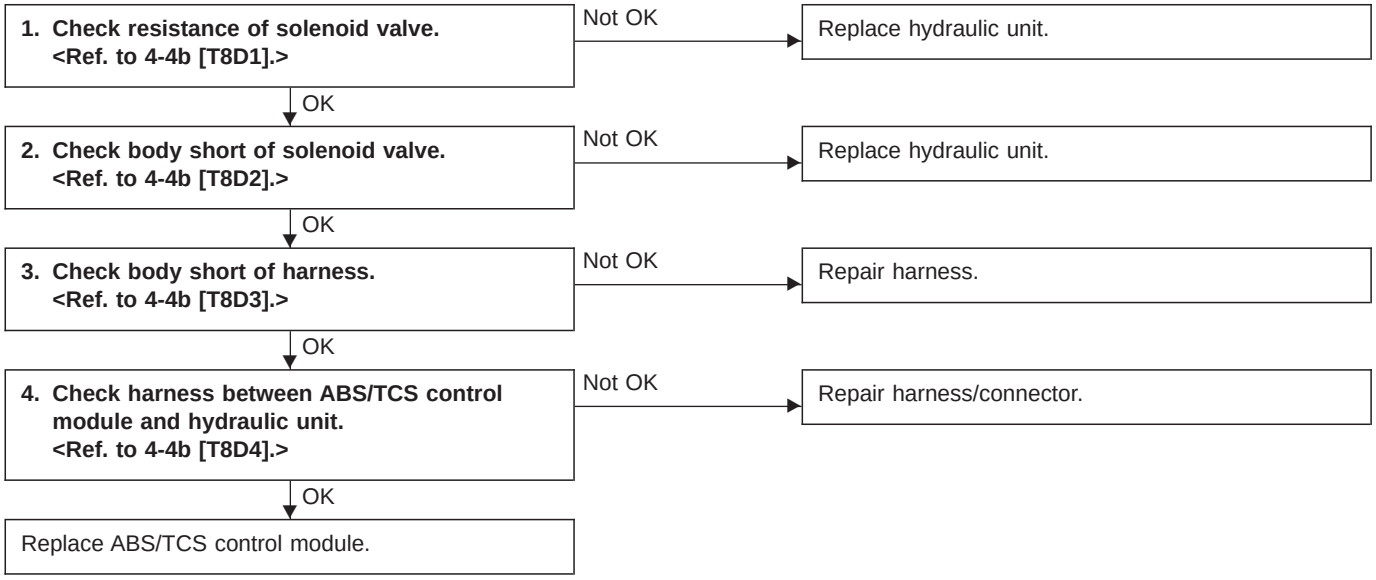
— Faulty front right inlet solenoid valve —

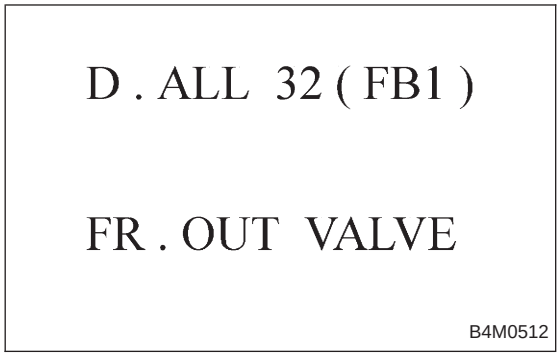
DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.





M: TROUBLE CODE 32

FR.OUT VALVE

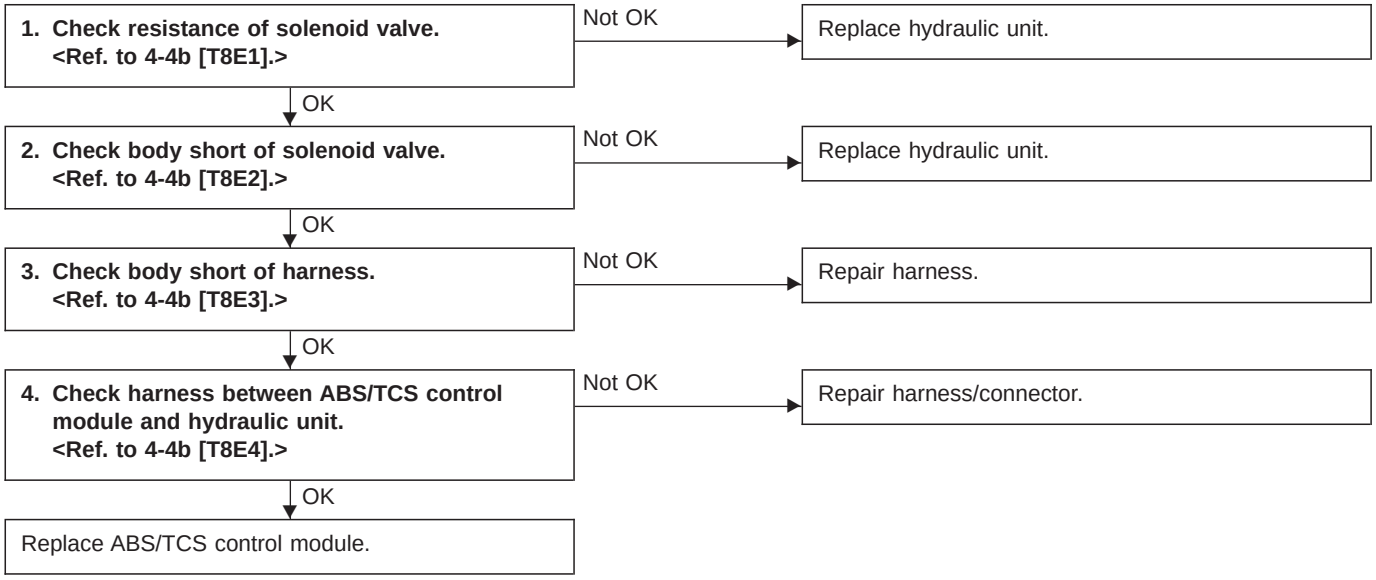
— Faulty front right outlet solenoid valve —

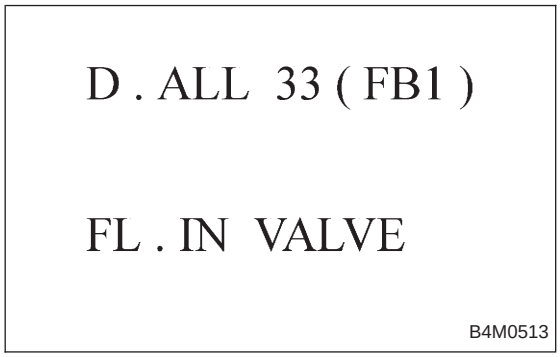
DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.





N: TROUBLE CODE 33

FL.IN VALVE

— Faulty front left inlet solenoid valve —

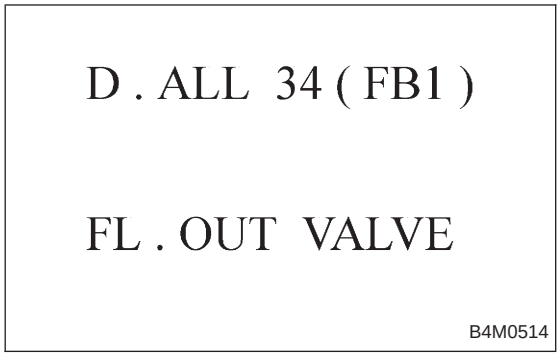
DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

NOTE:
The procedures used are the same as those for FR.IN VALVE.
<Ref. to 4-4b [T10L0].>



O: TROUBLE CODE 34

FL.OUT VALVE

— Faulty front left outlet solenoid valve —

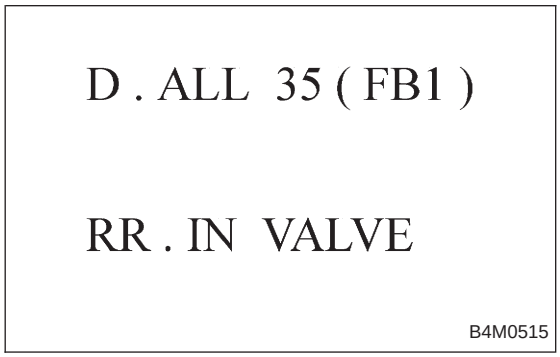
DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

NOTE:
The procedures used are the same as those for FR.OUT VALVE.
<Ref. to 4-4b [T10M0].>



P: TROUBLE CODE 35

RR.IN VALVE

— Faulty rear right inlet solenoid valve —

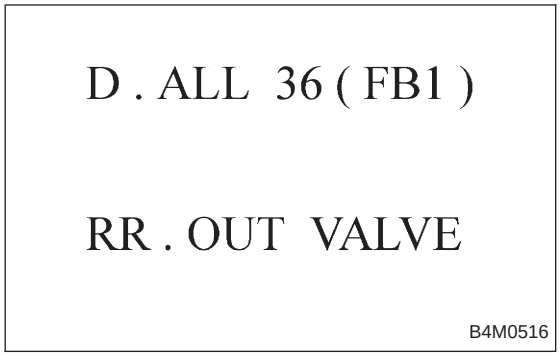
DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

NOTE:
The procedures used are the same as those for FR.IN VALVE.
<Ref. to 4-4b [T10L0].>



Q: TROUBLE CODE 36

RR.OUT VALVE

— Faulty rear right outlet solenoid valve —

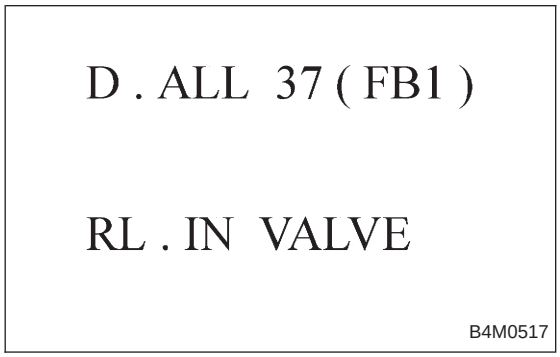
DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

NOTE:
The procedures used are the same as those for FR.OUT VALVE.
<Ref. to 4-4b [T10M0].>



R: TROUBLE CODE 37

RL.IN VALVE

— Faulty rear left inlet solenoid valve —

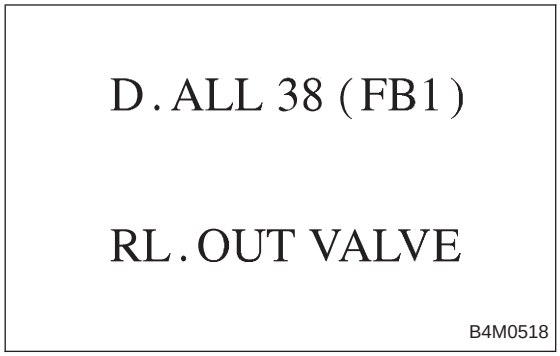
DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

NOTE:
The procedures used are the same as those for FR.IN VALVE.
<Ref. to 4-4b [T10L0].>



S: TROUBLE CODE 38

RL.OUT VALVE

— Faulty rear left outlet solenoid valve —

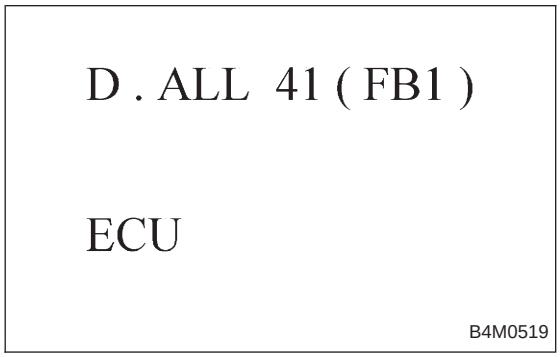
DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

NOTE:
The procedures used are the same as those for FR.OUT VALVE.
<Ref. to 4-4b [T10M0].>



T: TROUBLE CODE 41

ECU

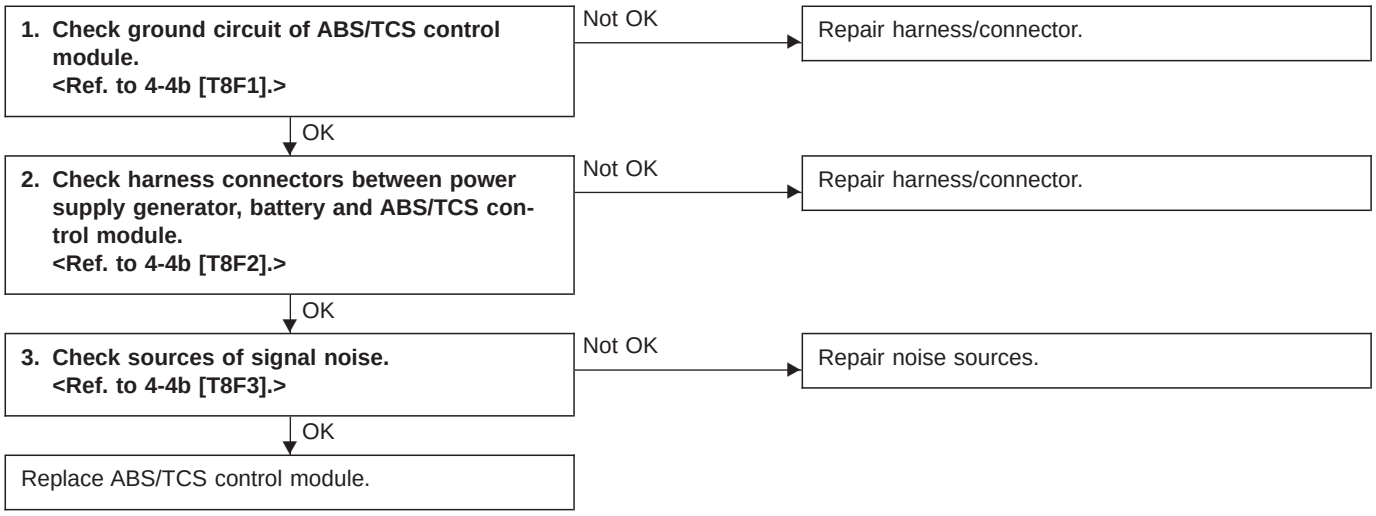
— Faulty ABS/TCS control module —

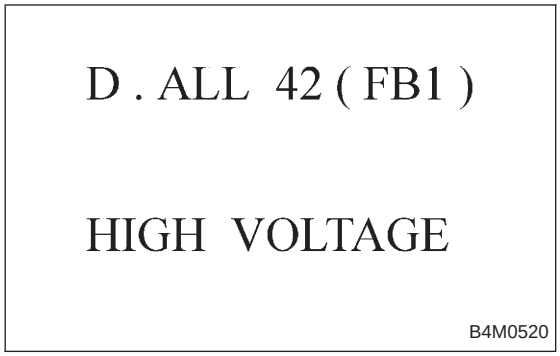
DIAGNOSIS:

- Faulty ABS/TCS control module
- Faulty harness/connector

TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.





U: TROUBLE CODE 42

HIGH VOLTAGE

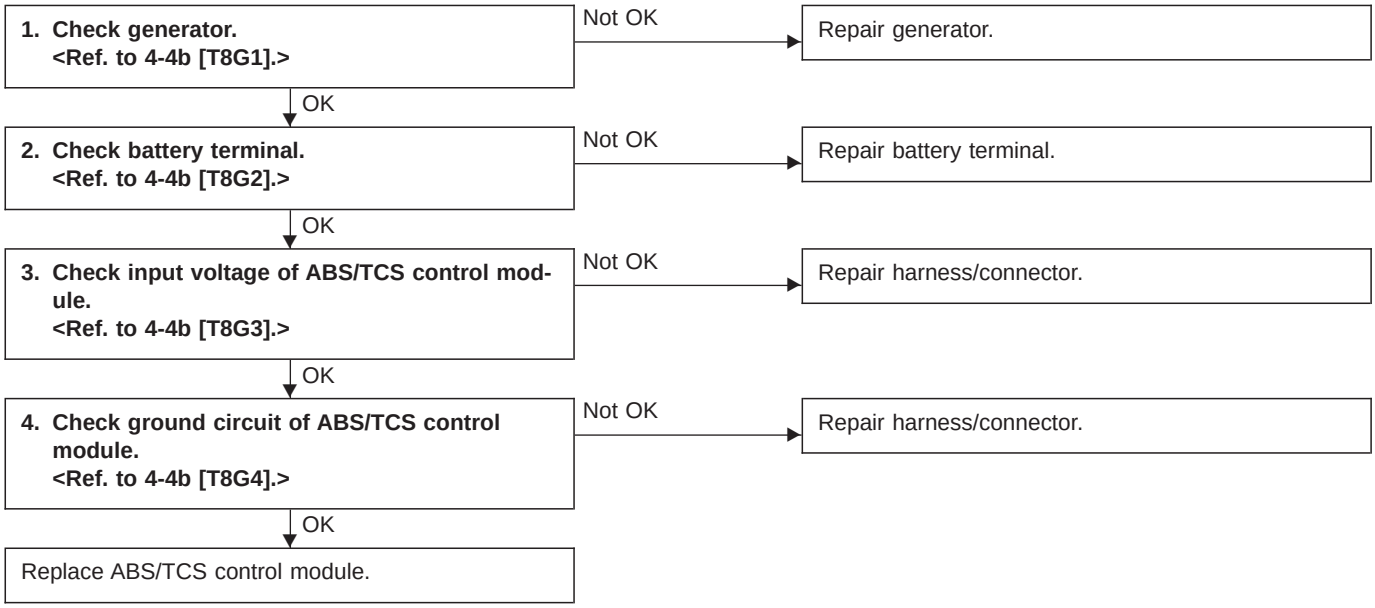
— Source voltage is high —

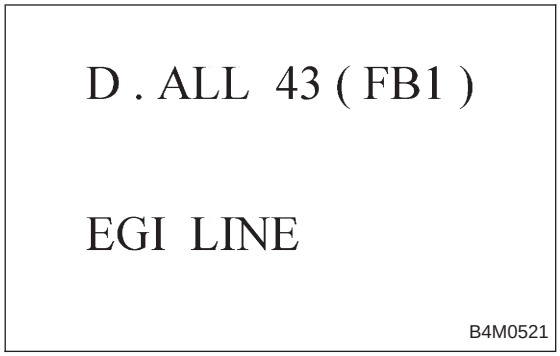
DIAGNOSIS:

- Power source voltage of the ABS/TCS control module is more than 18 V.
- Faulty ABS/TCS control module
- Faulty harness/connector

TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.





V: TROUBLE CODE 43

EGI LINE

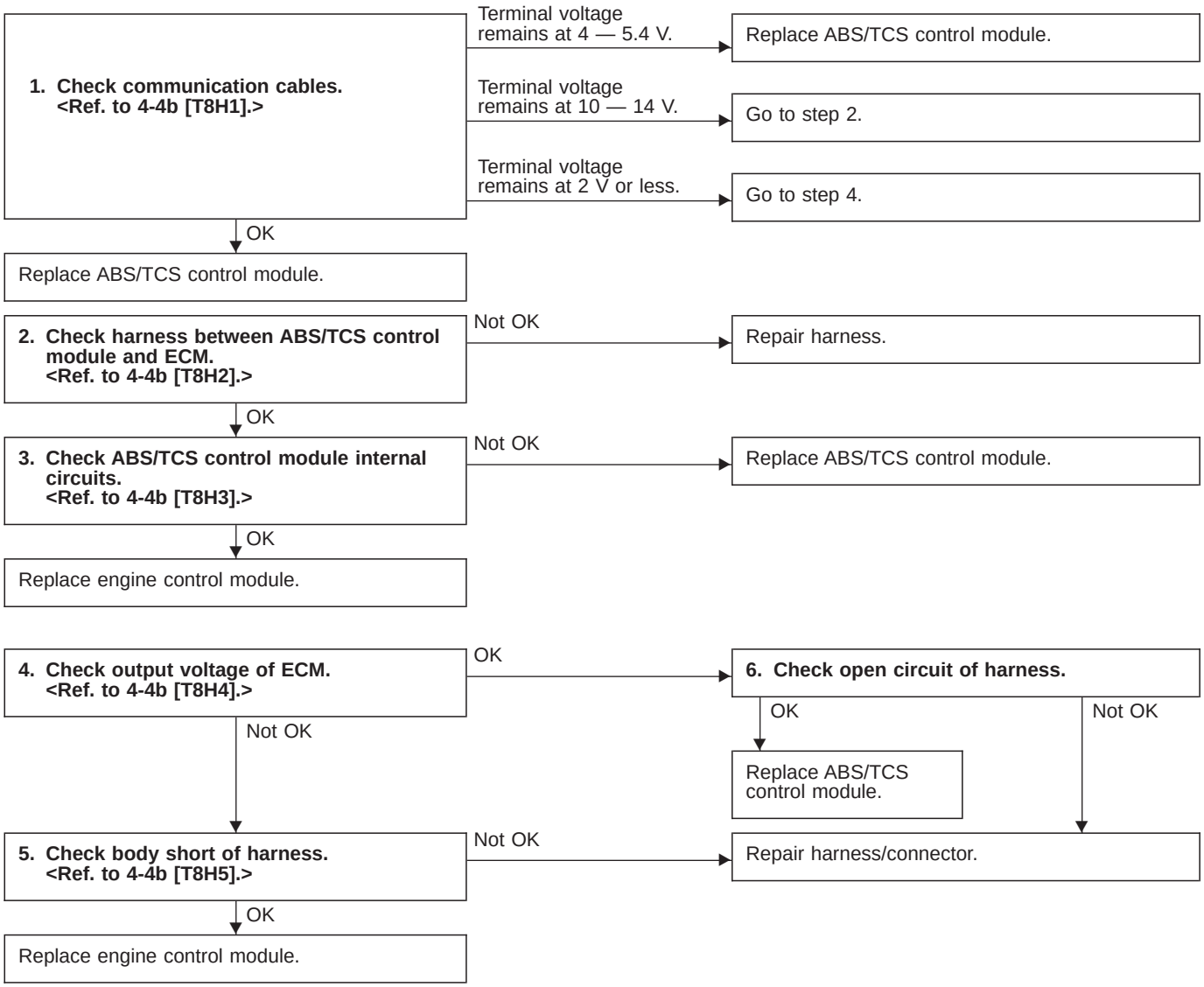
— Faulty engine control module communication cables —

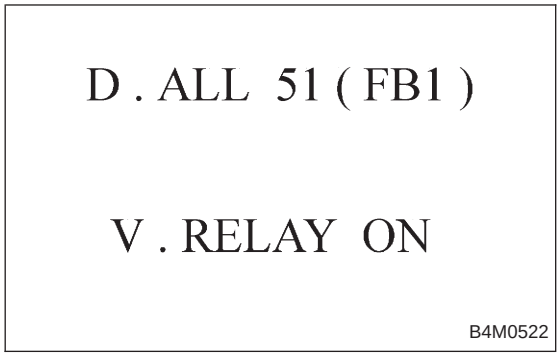
DIAGNOSIS:

- AET communication cable is broken or short circuited.
- AEB communication cable is broken or short circuited.
- AEC communication cable is broken or short circuited.
- Faulty ABS/TCS control module
- Faulty engine control module

TROUBLE SYMPTOM:

- TCS does not operate.





W: TROUBLE CODE 51

1. V.RELAY ON

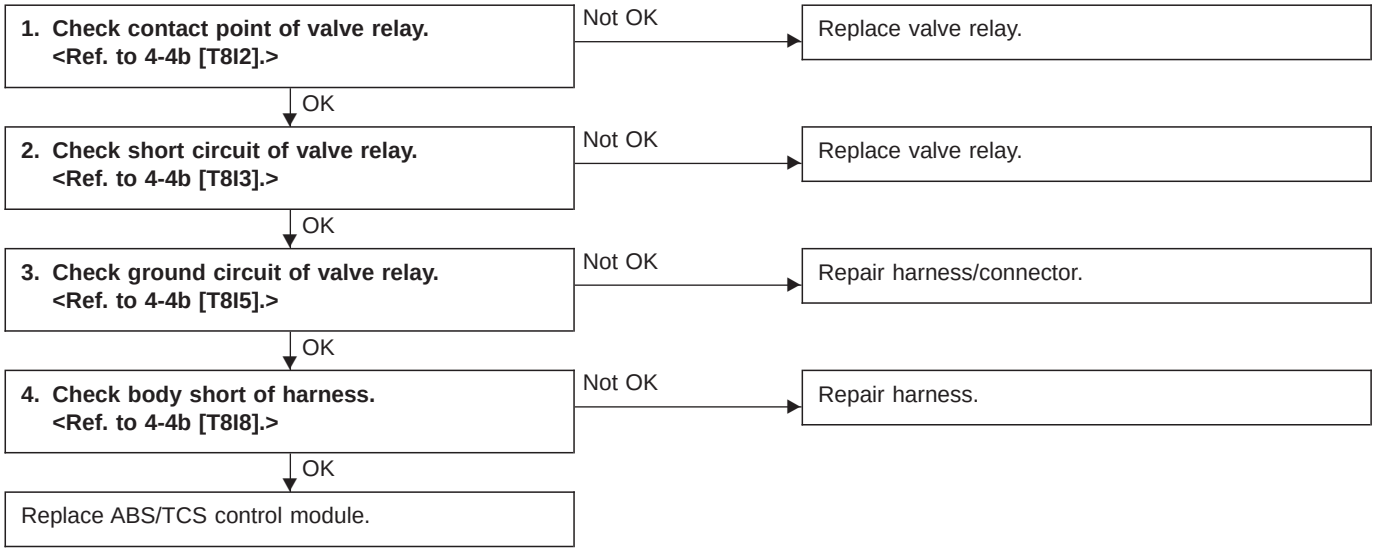
— Valve relay ON malfunction —

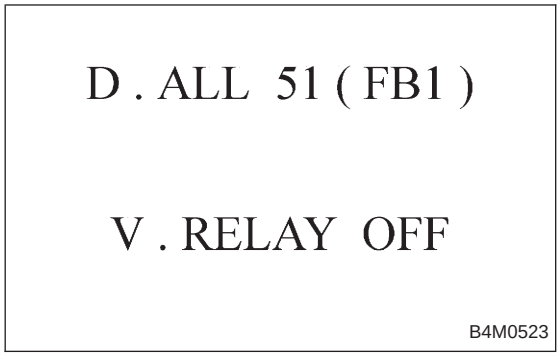
DIAGNOSIS:

- Faulty valve relay
- Faulty harness/connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.





2. V.RELAY OFF

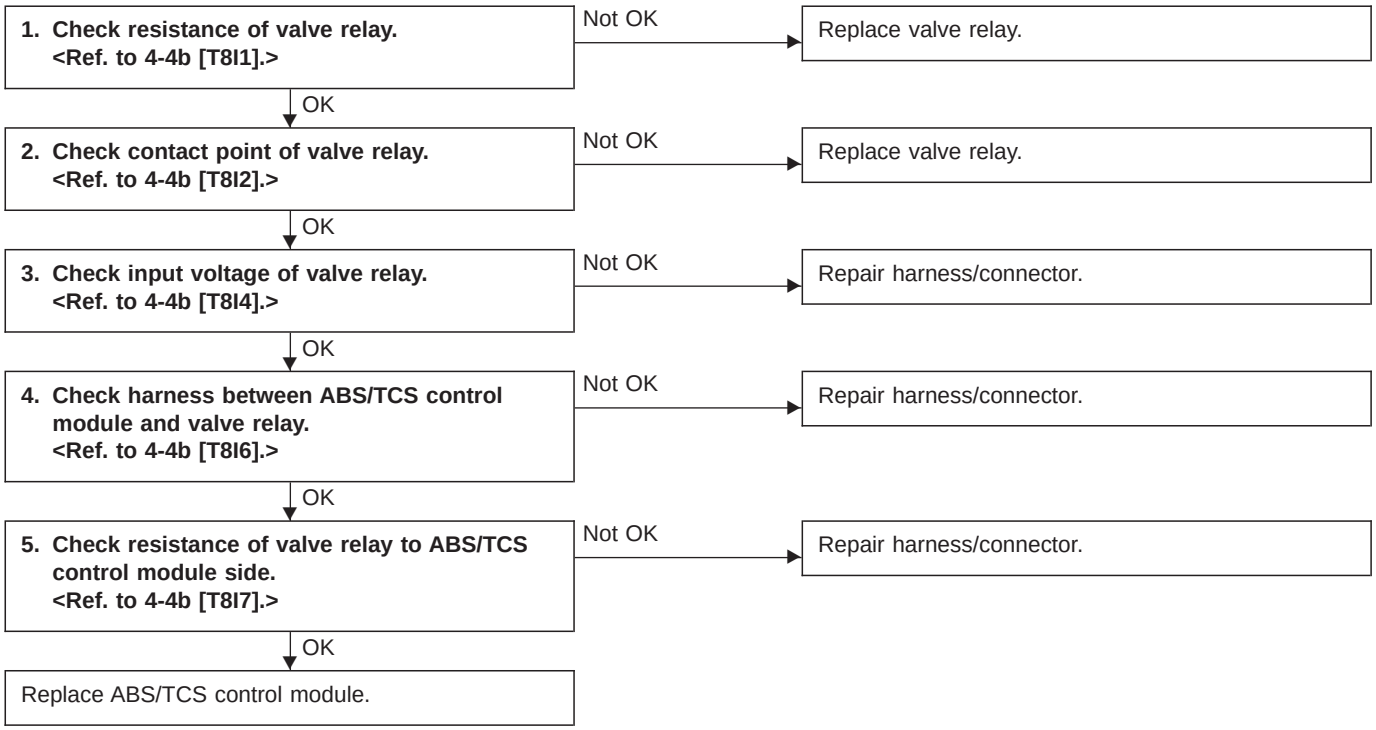
— Valve relay OFF malfunction —

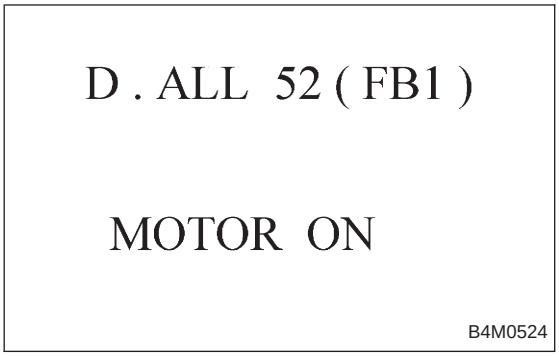
DIAGNOSIS:

- Faulty valve relay
- Faulty harness/connector
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.





X: TROUBLE CODE 52

1. MOTOR ON

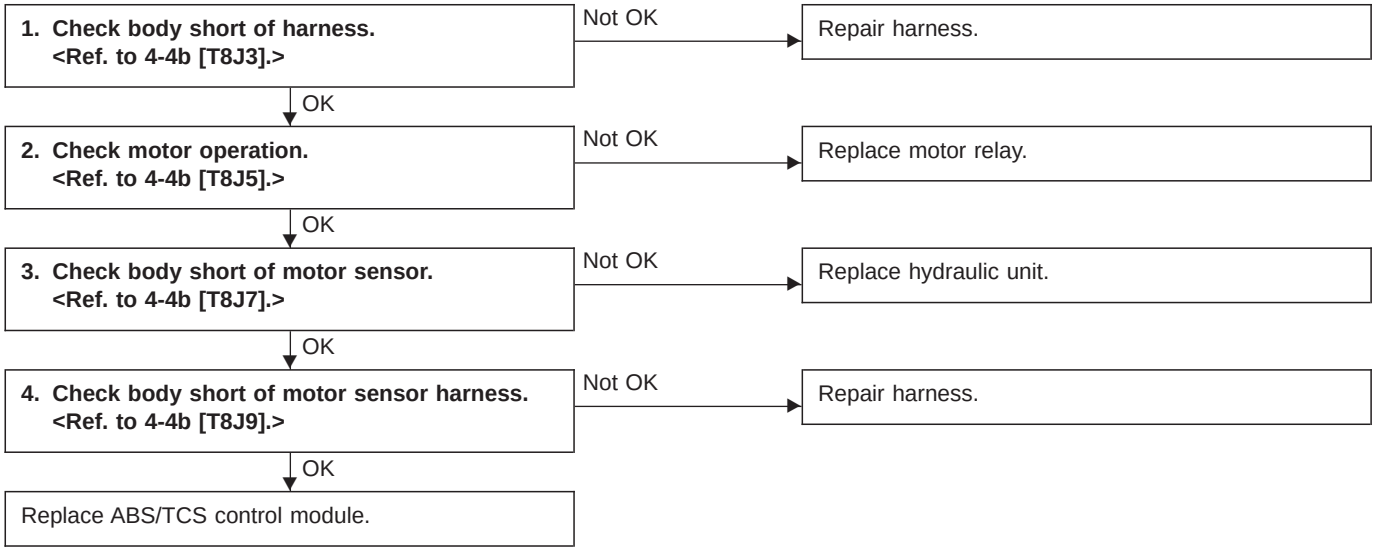
— Motor relay ON malfunction —

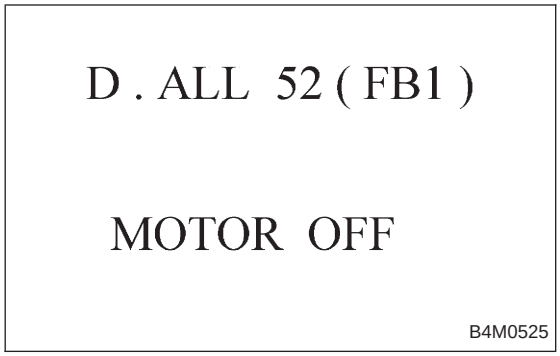
DIAGNOSIS:

- Faulty motor relay
- Faulty motor
- Faulty motor sensor
- Faulty harness
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS does not operate.
- TCS does not operate.





2. MOTOR OFF

— Motor relay OFF malfunction —

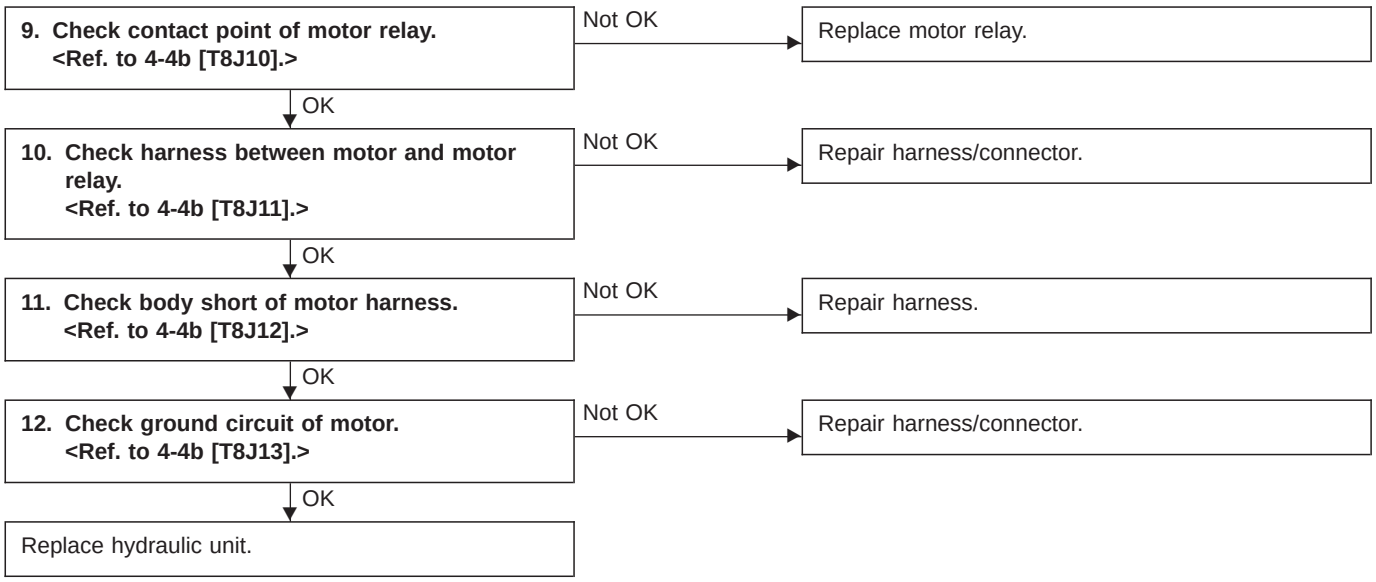
DIAGNOSIS:

- Faulty motor relay
- Faulty motor
- Faulty motor sensor
- Faulty harness/connector
- Faulty ABS/TCS control module

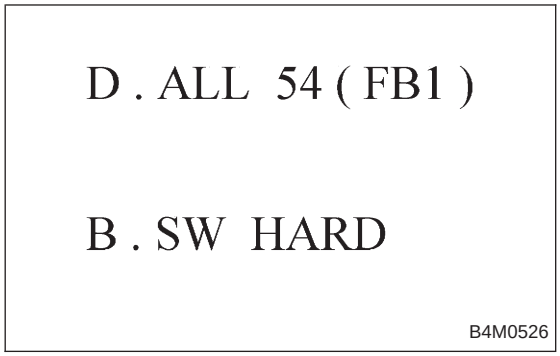
TROUBLE SYMPTOM:

- ABS and TCS do not operate.

1. Check resistance of motor relay. <Ref. to 4-4b [T8J1].>	Not OK →	Replace motor relay.
OK ↓		
2. Check input voltage of motor relay. <Ref. to 4-4b [T8J2].>	Not OK →	Repair harness/connector.
OK ↓		
3. Check harness between ABS/TCS control module and motor relay. <Ref. to 4-4b [T8J4].>	Not OK →	Repair harness/connector.
OK ↓		
4. Check motor operation. <Ref. to 4-4b [T8J5].>	Not OK →	Go to step 9.
OK ↓		
5. Check resistance of motor sensor. <Ref. to 4-4b [T8J6].>	Not OK →	Replace hydraulic unit.
OK ↓		
6. Check body short of motor sensor. <Ref. to 4-4b [T8J7].>	Not OK →	Replace hydraulic unit.
OK ↓		
7. Check harness between ABS/TCS control module and motor sensor. <Ref. to 4-4b [T8J8].>	Not OK →	Repair harness/connector.
OK ↓		
8. Check body short of motor sensor harness. <Ref. to 4-4b [T8J9].>	Not OK →	Repair harness.
OK ↓		
Replace ABS/TCS control module.		



NOTE:
The check can also be made by analyzing the sensor output signal with oscilloscope during the TCS sequence control operation. If the ECM female connector end gives correct value, skip steps 5 through 8.
If not, operate the TCS sequence control again and measure the value at motor sensor male connector end, with the motor sensor connector disconnected. If the value is OK, proceed with steps 7 through 8 above.



Y: TROUBLE CODE 54

1. B.SW HARD

— Break and short circuit at stroke sensor or its wiring —

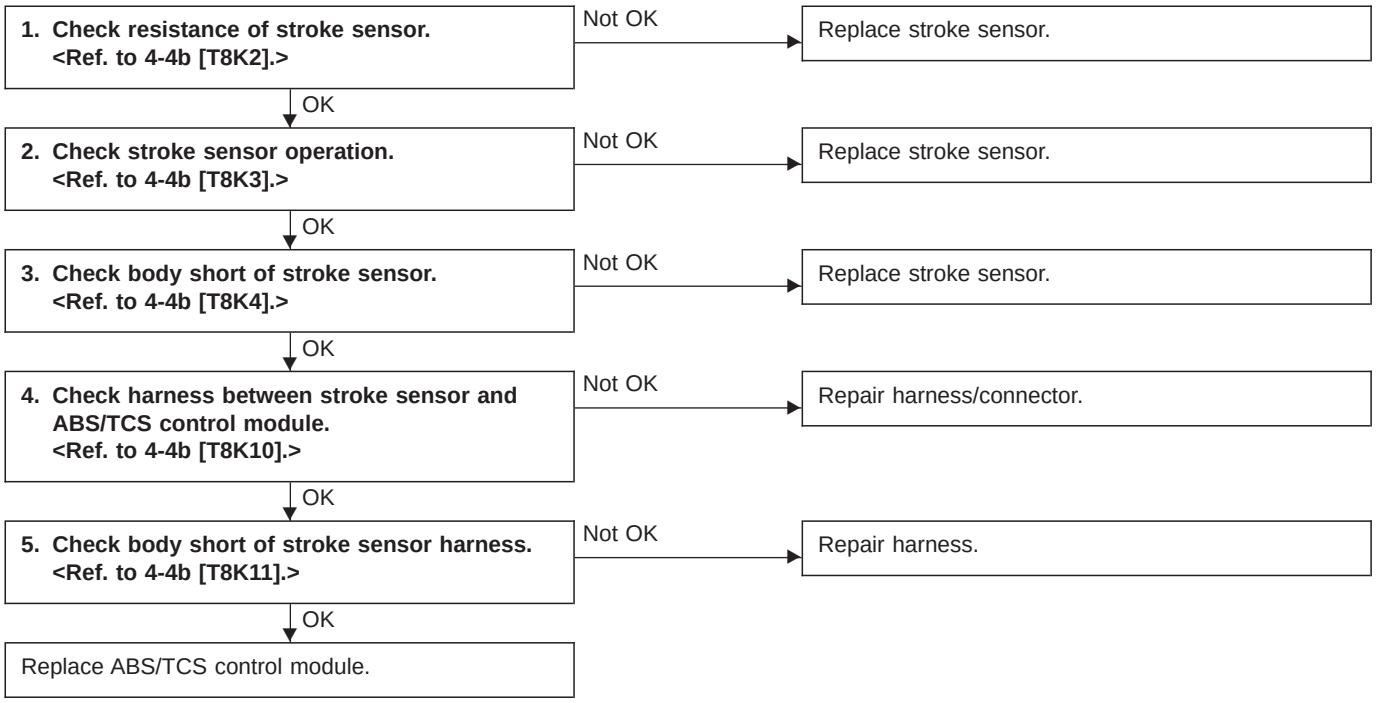
DIAGNOSIS:

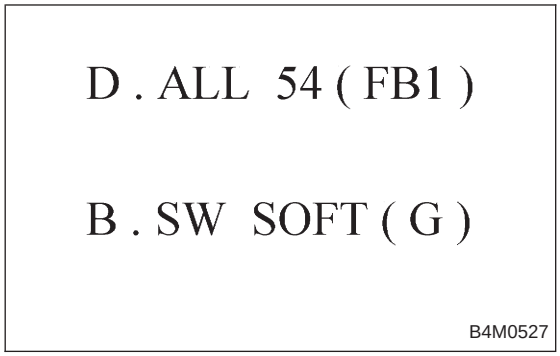
- Faulty stroke sensor
- Faulty harness/connector
- Faulty stop light switch
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
Operate the function F09 in select monitor TCS mode, and read the sensor output step.
If system is normal, the output reading is 1 when brake pedal is not depressed, and it changes from 2 to 3, 4 and 5 in accordance with the brake pedal depressing. If so, skip check steps 1 through 5.





2. B.SW SOFT (G)

— Irregular value in comparison stroke sensor and vehicle acceleration comparison —

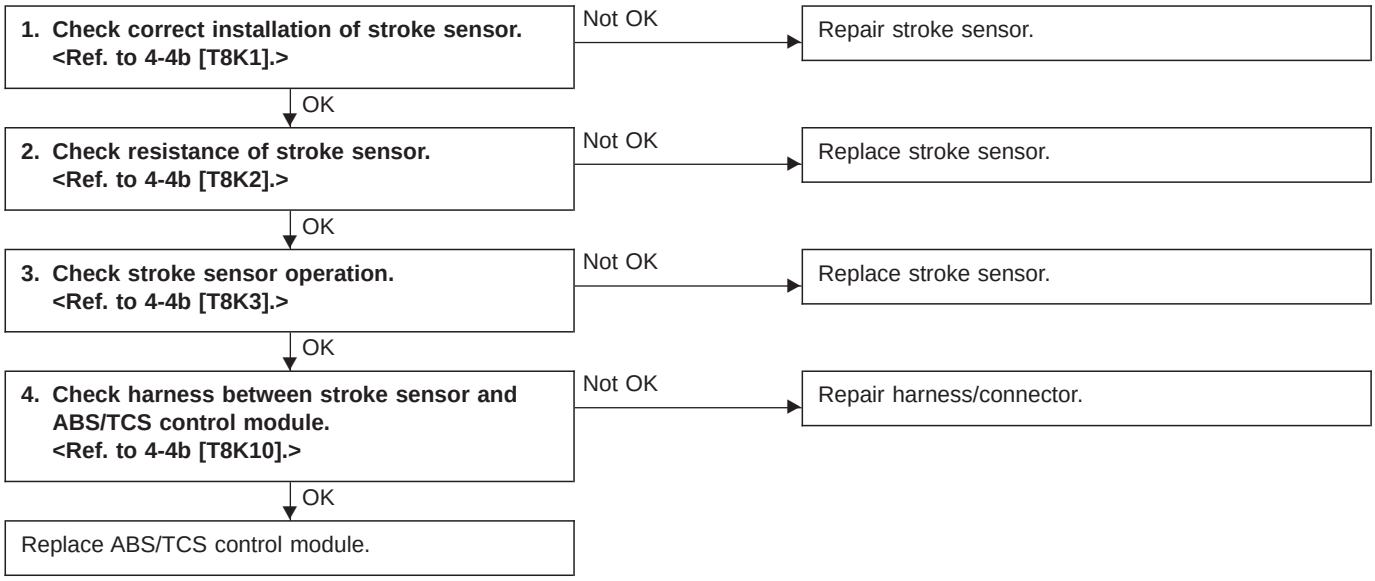
DIAGNOSIS:

- Faulty stroke sensor
- Faulty harness/connector
- Faulty stop light switch
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
Operate the function F09 in select monitor TCS mode, and read the sensor output step.
If system is normal, the output reading is 1 when brake pedal is not depressed, and it changes from 2 to 3, 4 and 5 in accordance with the brake pedal depressing. If so, skip check steps 2 through 4.



3. B.SW SOFT (B)

— Irregular value in stroke sensor and brake light switch comparison —

DIAGNOSIS:

- Faulty stroke sensor
- Faulty stop light switch
- Faulty harness/connector
- Faulty ABS/TCS control module

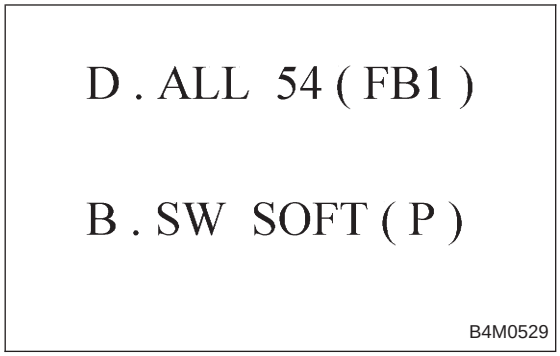
TROUBLE SYMPTOM:

- ABS and TCS do not operate.

NOTE:
Operate the function F09 in select monitor TCS mode, and read the sensor output step.
If system is normal, the output reading is 1 when brake pedal is not depressed, and it changes from 2 to 3, 4 and 5 in accordance with the brake pedal depressing. If so, skip check steps 1 and 2 through 7.
Then, operate the function FA0 and check the stop and brake switches by B1 LED ON/OFF. If system is normal, LED comes on when depressing brake pedal, and goes off when not depressing. If so, skip check steps 3 through 6.

1. **Check resistance of stroke sensor.** **<Ref. to 4-4b [T8K2].>**
   - Not OK → Replace stroke sensor.
   - OK ↓
2. **Check stroke sensor operation.** **<Ref. to 4-4b [T8K3].>**
   - Not OK → Replace stroke sensor.
   - OK ↓
3. **Check contact point of stop light switch.** **<Ref. to 4-4b [T8K5].>**
   - Not OK → Replace stroke sensor.
   - OK ↓
4. **Check body short of stop light switch.** **<Ref. to 4-4b [T8K6].>**
   - Not OK → Replace stroke sensor.
   - OK ↓
5. **Check power supply of stop light switch.** **<Ref. to 4-4b [T8K7].>**
   - Not OK → Repair harness/connector.
   - OK ↓
6. **Check input voltage of ABS/TCS control module.** **<Ref. to 4-4b [T8K8].>**
   - Not OK → Repair harness/connector.
   - OK ↓
7. **Check harness between stroke sensor and ABS/TCS control module.** **<Ref. to 4-4b [T8K10].>**
   - Not OK → Repair harness/connector.
   - OK ↓

Replace ABS/TCS control module.



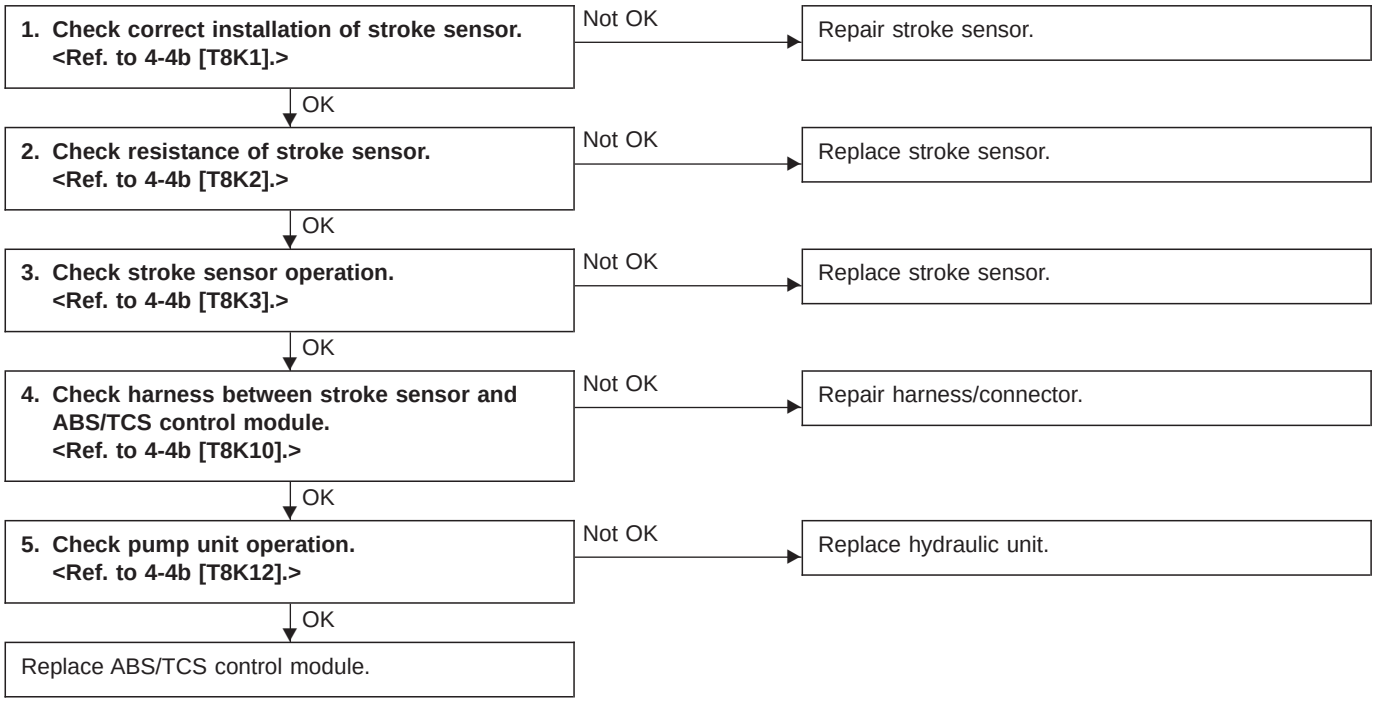
4. B.SW SOFT (P)

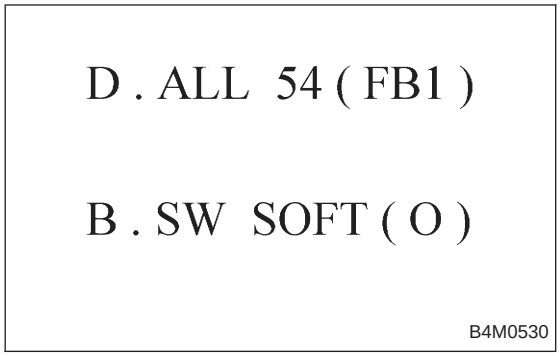
— Comparison between stroke sensor and pump output —

DIAGNOSIS:

- Faulty stroke sensor
- Faulty harness/connector
- Faulty pump unit in hydraulic unit
- Faulty stop light switch
- Faulty ABS/TCS control module

NOTE:
Operate the function F09 in select monitor TCS mode, and read the sensor output step.
If system is normal, the output reading is 1 when brake pedal is not depressed, and it changes from 2 to 3, 4 and 5 in accordance with the brake pedal depressing. If so, skip check steps 2 through 4.





5. B.SW SOFT (O)

— Broken brake light switch —

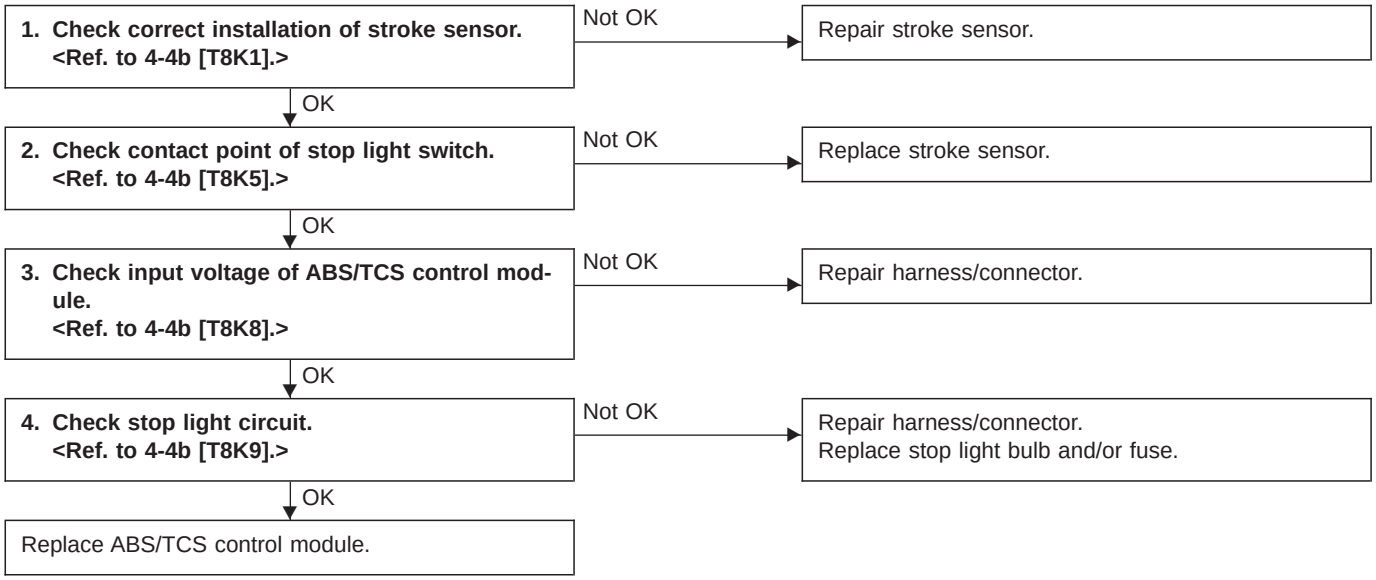
DIAGNOSIS:

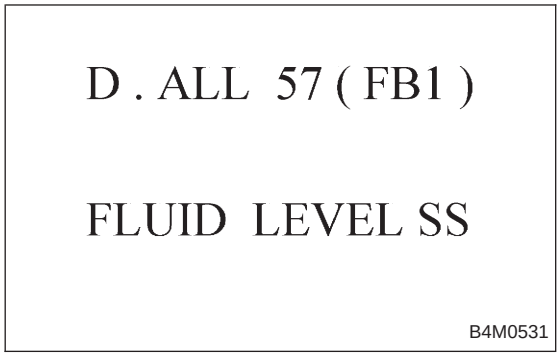
- Faulty stop light switch
- Faulty harness/connector
- Faulty stroke sensor
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- TCS does not operate.

NOTE:
Operate the function FA0 in select monitor TCS mode, and check the stop and brake switches by B1 LED ON/OFF. If system is normal, LED comes on when depressing brake pedal, and goes off when not depressing. If so, skip check steps 2 through 4.





Z: TROUBLE CODE 57

FLUID LEVEL SS

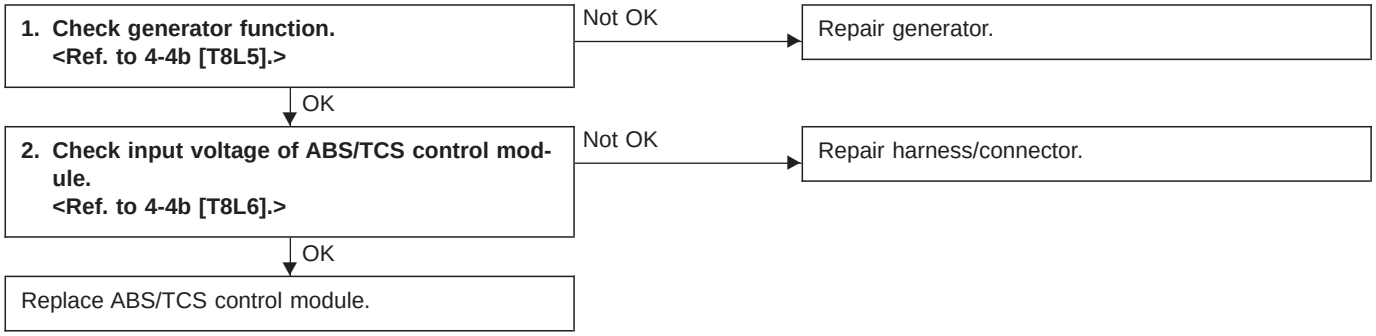
— Irregular signal from fluid level sensor —

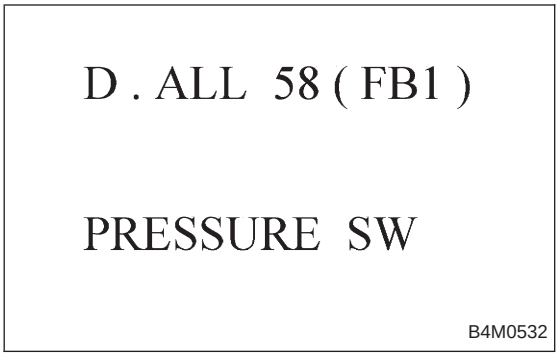
DIAGNOSIS:

- Faulty fluid level sensor circuit
- Faulty harness/connector
- Faulty ABS/TCS control module
- Faulty generator

TROUBLE SYMPTOM:

- ABS and TCS do not operate.





AA: TROUBLE CODE 58

PRESSURE SW

— Faulty pressure switch —

DIAGNOSIS:

- Faulty pressure
- Faulty stop light switch
- Faulty ABS/TCS control module
- Faulty harness/connector

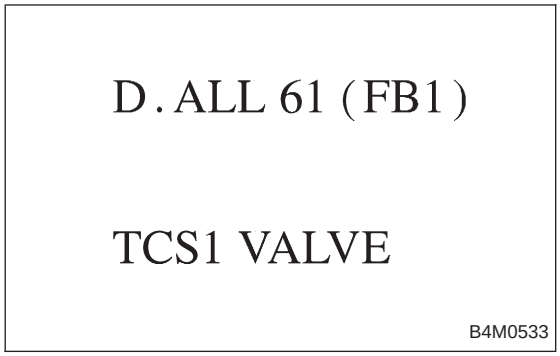
TROUBLE SYMPTOM:

- TCS does not operate.

NOTE:
Check using the select monitor.
Operate the function FA0 in select monitor TCS mode. The stop and brake switches can be checked by B1 LED ON/OFF. If system is normal, LED comes on when depressing brake pedal, and goes off when not depressing. If so, skip check steps 5 through 8.

1. **Check contact point of pressure switch. <Ref. to 4-4b [T8M1].>**
   - Not OK → Replace hydraulic unit.
   - OK ↓
2. **Check body short of pressure switch. <Ref. to 4-4b [T8M2].>**
   - Not OK → Replace hydraulic unit.
   - OK ↓
3. **Check harness between pressure switch and ABS/TCS control module. <Ref. to 4-4b [T8M3].>**
   - Not OK → Repair harness/connector.
   - OK ↓
4. **Check body short of pressure switch harness. <Ref. to 4-4b [T8M4].>**
   - Not OK → Repair harness.
   - OK ↓
5. **Check contact point of stop light switch. <Ref. to 4-4b [T8M5].>**
   - Not OK → Replace stroke sensor.
   - OK ↓
6. **Check body short of stop light switch. <Ref. to 4-4b [T8M6].>**
   - Not OK → Replace stroke sensor.
   - OK ↓
7. **Check power supply of stop light switch. <Ref. to 4-4b [T8M7].>**
   - Not OK → Repair harness.
   - OK ↓
8. **Check input voltage of ABS/TCS control module. <Ref. to 4-4b [T8M8].>**
   - Not OK → Repair harness/connector.
   - OK ↓

Replace ABS/TCS control module.



AB: TROUBLE CODE 61

TCS 1 VALVE

— Faulty TCS 1 solenoid valve —

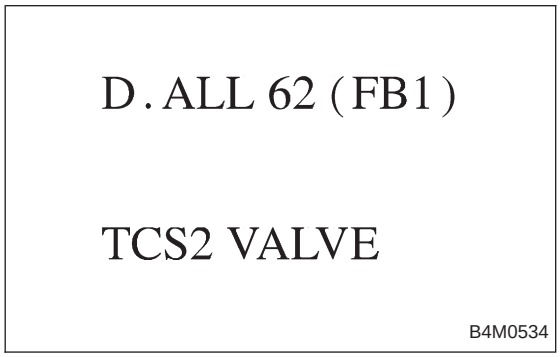
DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

NOTE:
The procedures used are the same as those for FR.IN VALVE.
<Ref. to 4-4b [T10L0].>



AC: TROUBLE CODE 62

TCS 2 VALVE

— Faulty TCS 2 solenoid valve —

DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

NOTE:
The procedures used are the same as those for FR.OUT VALVE.
<Ref. to 4-4b [T10M0].>

11. General Diagnostics Table

◎: Primary expected causes ○: Secondary expected causes

Symptoms		Trouble conditions	Hydraulic unit																							
			Solenoid valve	Motor	Mount bush	Speed sensor	P valve	Master cylinder	Calipers and piston	Pad	Rotor	Hand brake	Piping	Mixture of air	Brake booster and check valve	Axle and wheel	Alignment	Play of pedal	Rough road surface	Semicylindrical road surface	Loose or worn suspension	Tire	Wrong connection and wiring	Stroke sensor
ABS function	Directional stability cannot be obtained when braking.	Vehicle turns to right or left.	◎			◎	○		◎	◎	○		○			○	◎		◎	◎	○	◎	◎	
		Vehicle spins.	◎			◎	○		○	◎			○									◎	◎	
	Out-of-order brakes	Long braking distance	◎	○		○	○	○	○	◎	○		○	◎	○							◎	◎	
		Brakes lock.	◎	○		◎	○		○				○										◎	
		Brakes drag.	◎			◎	○	◎	◎	○		◎	○			◎		◎						
		Long pedal stroke	○				○	○	○	○			○	◎	○			○						
		Abnormal vehicle pitching	○			○													◎		◎		◎	
		Unstable braking force. One-side brake refuses to work.	◎			◎		○	◎	◎	○		○			○	○		◎	○	○	◎	◎	
TCS function	When accelerating abruptly, directional stability cannot be obtained when traveling on a slippery road surface.	Vehicle moves unsteadily.	◎			◎			◎	◎			○				◎		◎		○	◎	◎	
		Handle refuses to work.	◎			◎			◎	◎			○									◎	◎	
		Handle loses control.	◎			◎			◎	◎	○		○				○		◎	○	○	◎	◎	
	Bad acceleration, engine stalling (In addition to the causes listed here, check the ECM specifications.)	Engine stalls. Engine speed fails to increase.	◎			◎		◎	◎				○										◎	
		Engine speed increases suddenly.	◎			◎		◎	◎	◎	○	◎	○	◎									◎	◎
Vibration occurs and abnormal noise is produced. ● When applying brakes abruptly. ● When accelerating abruptly. ● When driving on a slippery road surface.		Brake pedal heavily vibrates when applying brakes.	○	○			○								○				◎		○		◎	◎
		Loud hydraulic unit operating noise	○	○	◎	◎							◎											
		Noise is produced from front of vehicle.	○		◎	◎		◎	◎	◎	◎		◎		◎	○					◎	○		
		Noise is produced from rear of vehicle.				◎			◎	◎	◎	◎	◎			○					◎	○		

NOTE:
This list includes no engine failure and transmission failure.

12. Phenomena Peculiar to the System

1. WHEN TRAVELING WITH EXTREMELY UNDER INFLATED TIRES

The TCS is apt to operate (particularly when turning) and, when it operates, acceleration can become slow*. This state is not abnormal. Immediately restore the tires to normal by traveling after releasing the TCS with the TCS OFF switch.

* Poor acceleration is sometimes caused by the engine itself. Check whether or not the TCS operating indicator light (green) comes on to determine that the failure is caused by the TCS control.

2. WHEN THE T TIRES ARE FITTED

The TCS is apt to operate (particularly when turning) and, when it operates, acceleration can become slow. This state is not abnormal. Immediately restore the tires to normal by traveling after releasing the TCS with the TCS OFF switch.

3. WHEN OPERATING THE TCS CONTINUOUSLY ON A SLOPE IMPOSSIBLE TO CLIMB OR IN STACK STATE

When operating the TCS for a long time, it can be automatically turned off (the OFF indicator light will come on), stopping braking. This state is not abnormal. It automatically resets by stopping and leaving the vehicle.

4. WHEN HEAVY LOAD IS PLACED ON THE BRAKES

If service brakes are used too often when descending a long slope, heavy load can be placed on the brakes. To prevent this problem, the TCS is automatically turned off (the OFF indicator light will come on). This state is not abnormal. Stop the vehicle and leave it in the same way as step 3, it automatically resets.

5. KICKBACK TO THE BRAKE PEDAL WHEN THE ABS IS OPERATING

Compared with ABS of the AWD model system, pedal kickback with large amplitude of vibration and long cycle can be felt. This is caused by the difference in system configuration and, therefore, not abnormal. If you receive an inquiry from your clients, fully explain this point.

6. INSPECTOR

Before advancing the vehicle after the engine starts, drive the pump motor and valve for a very short time to functionally check the ABS/TCS brakes. It is not abnormal if, at this time, operating noises of the valve and motor are produced or kickback of the brake pedal is felt when stepping on the pedal.

7. WHEN ATTACHING CHAINS

It is sometimes a good idea to turn off the TCS for better advancing and accelerating the vehicle.

8. WHEN A DRUM TESTER IS USED (SPEEDOMETER TEST, EXHAUST GAS TEST, BRAKE TEST, ETC.)

Before performing tests, turn the TCS off by operating the TCS OFF switch or disconnect the fuse of ECM input power source to put the machine out of operation. If operating other parts to put the TCS in the fail state intentionally, trouble code will be recorded. Make sure to clear the memory. Also, in a 2-wheel tester, wheel speed sensor failure can be detected, making the TCS fail. This case is also not abnormal and clearing the memory is required.

1. Supplemental Restraint System “Airbag”

Airbag system wiring harness is routed near the ABS control module, ABS sensor and hydraulic control unit.

CAUTION:
● All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
● Be careful not to damage Airbag system wiring harness when servicing the ABS control module, ABS sensor and hydraulic control unit.

2. Pre-inspection

Before performing diagnostics, check the following items which might affect ABS problems:

A: MECHANICAL INSPECTION

1. POWER SUPPLY

1) Measure battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V, or more
Specific gravity: Above 1.260

2) Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

2. BRAKE FLUID

1) Check brake fluid level.
2) Check brake fluid leakage.

3. BRAKE DRAG

Check brake drag. <Ref. to 4-4 [K100].>

4. BRAKE PAD AND ROTOR

Check brake pad and rotor. <Ref. to 4-4 [K100].>

5. TIRE SPECIFICATIONS, TIRE WEAR AND AIR PRESSURE

Check tire specifications, tire wear and air pressure. <Ref. to 4-2 [S1A0].>

1. Supplemental Restraint System “Airbag”

Airbag system wiring harness is routed near the ABS control module, ABS sensor and hydraulic control unit.

CAUTION:
● All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
● Be careful not to damage Airbag system wiring harness when servicing the ABS control module, ABS sensor and hydraulic control unit.

2. Pre-inspection

Before performing diagnostics, check the following items which might affect ABS problems:

A: MECHANICAL INSPECTION

1. POWER SUPPLY

1) Measure battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V, or more
Specific gravity: Above 1.260

2) Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

2. BRAKE FLUID

1) Check brake fluid level.
2) Check brake fluid leakage.

3. BRAKE DRAG

Check brake drag. <Ref. to 4-4 [K100].>

4. BRAKE PAD AND ROTOR

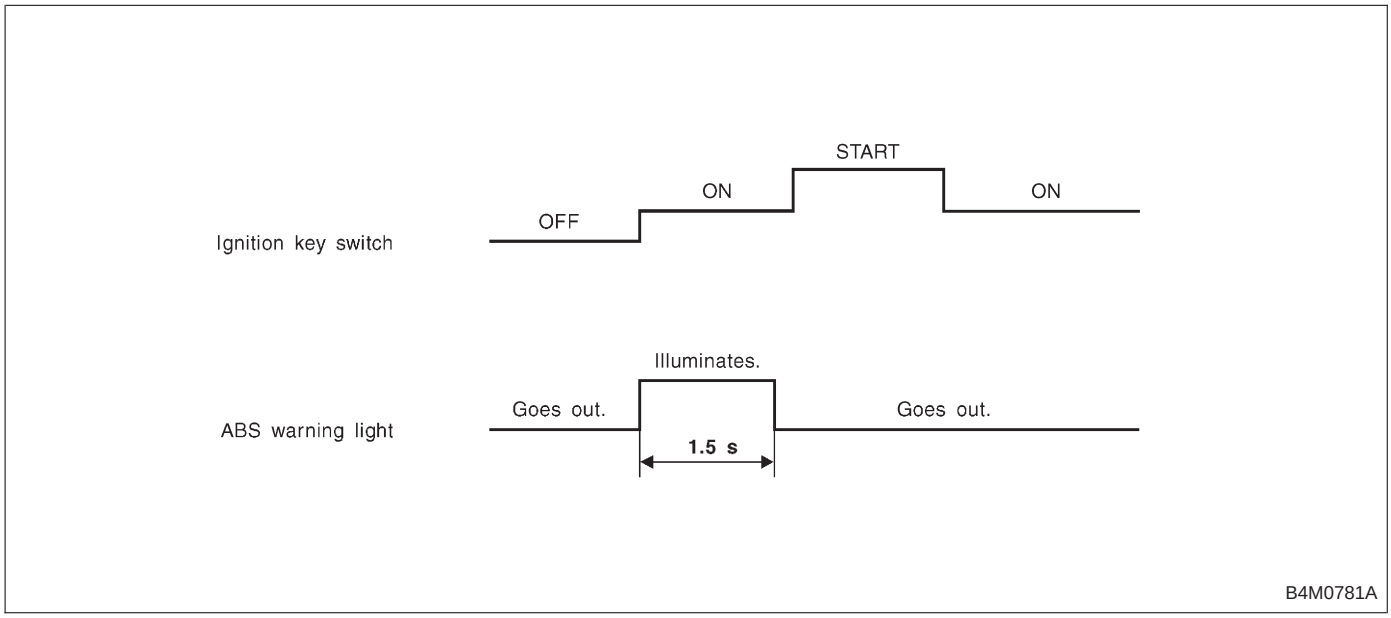
Check brake pad and rotor. <Ref. to 4-4 [K100].>

5. TIRE SPECIFICATIONS, TIRE WEAR AND AIR PRESSURE

Check tire specifications, tire wear and air pressure. <Ref. to 4-2 [S1A0].>

B: ELECTRICAL INSPECTION

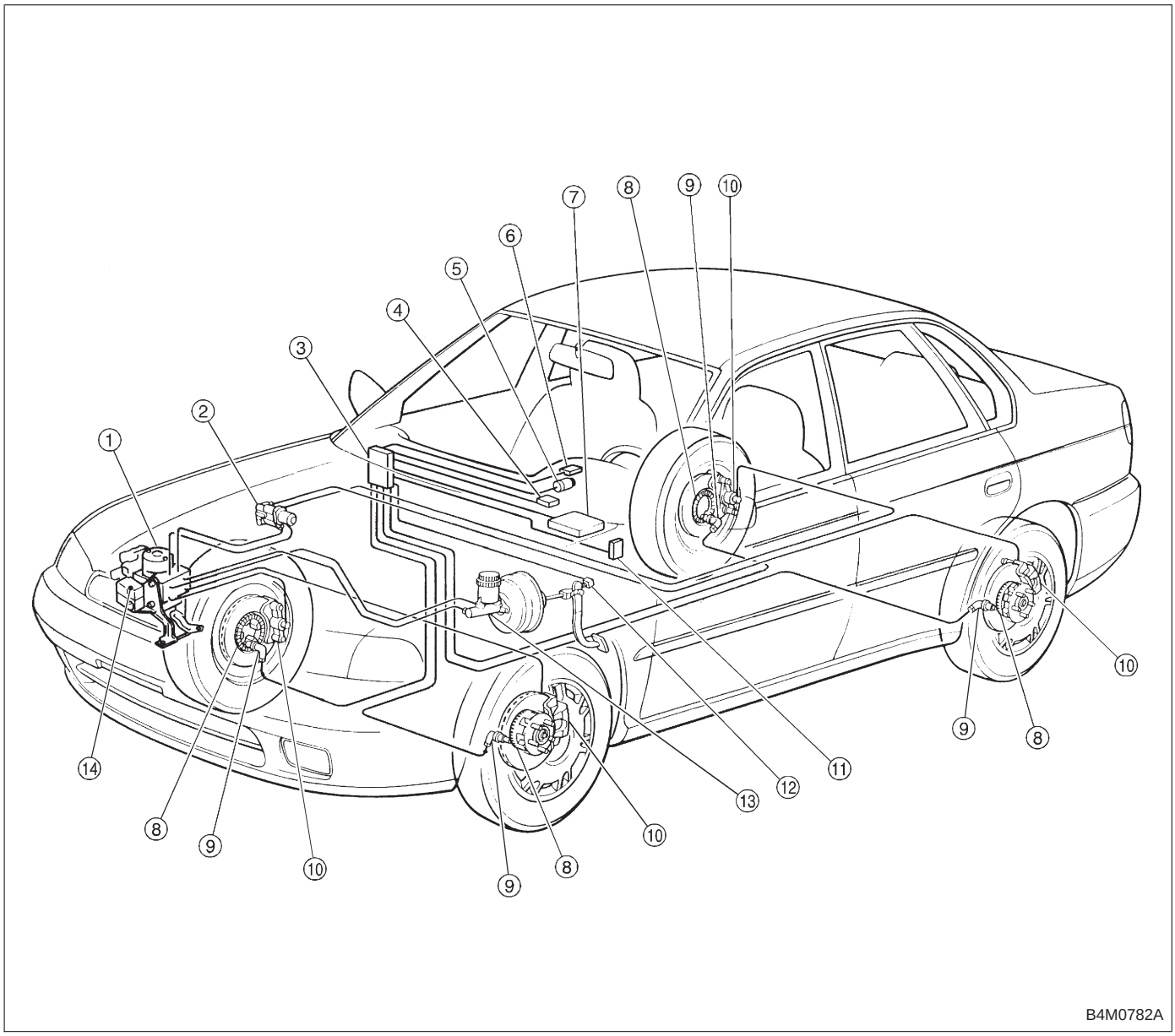
1. WARNING LIGHT ILLUMINATION PATTERN



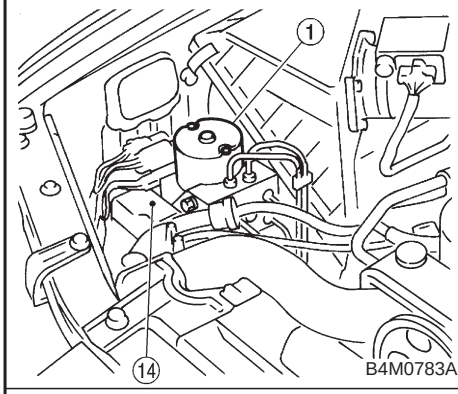
1) When the ABS warning light does not illuminate in accordance with this illumination pattern, there must be an electrical malfunction.
2) When the ABS warning light remains constantly OFF, refer to “7. Diagnostics Chart for ABS Warning Light Circuit and Diagnosis Circuit Failure” in this section, for repair. <Ref. to 4-4c [T7A0].>

NOTE:
Even though the ABS warning light does not go out 1.5 seconds after it illuminates, the ABS system operates normally when the warning light goes out while driving at approximately 12 km/h (7 MPH). However, the Anti-lock brakes do not work while the ABS warning light is illuminated.

3. Electrical Components Location



① Hydraulic control unit (H/U)
② Proportioning valve
③ ABS control module (ABSCM)
④ Diagnosis connector
⑤ ABS warning light
⑥ Data link connector (for Subaru select monitor)
⑦ Transmission control module (only AT vehicle)
⑧ Tone wheel
⑨ ABS sensor
⑩ Wheel cylinder
⑪ G sensor (only AWD vehicle)
⑫ Brake switch
⑬ Master cylinder
⑭ Relay box



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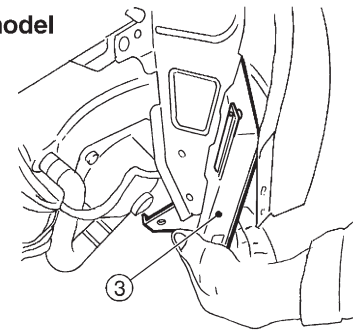
LHD model



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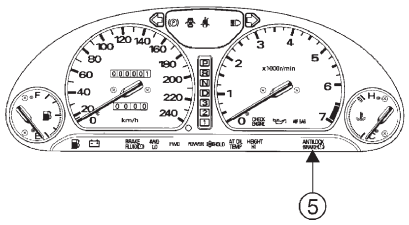

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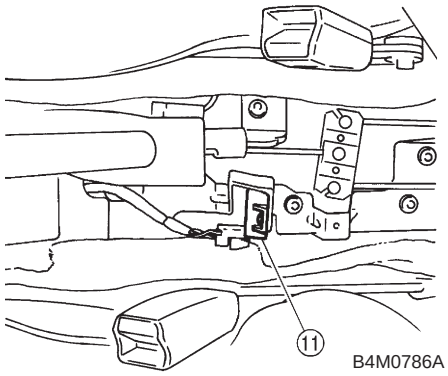

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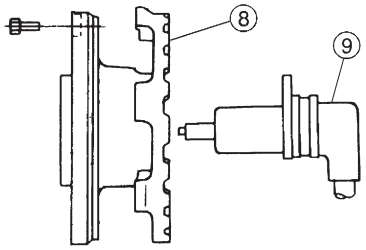

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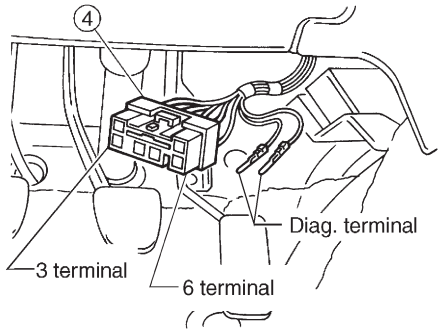

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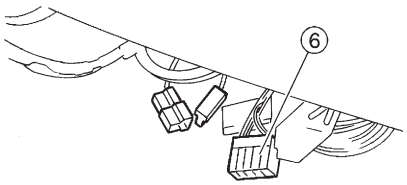

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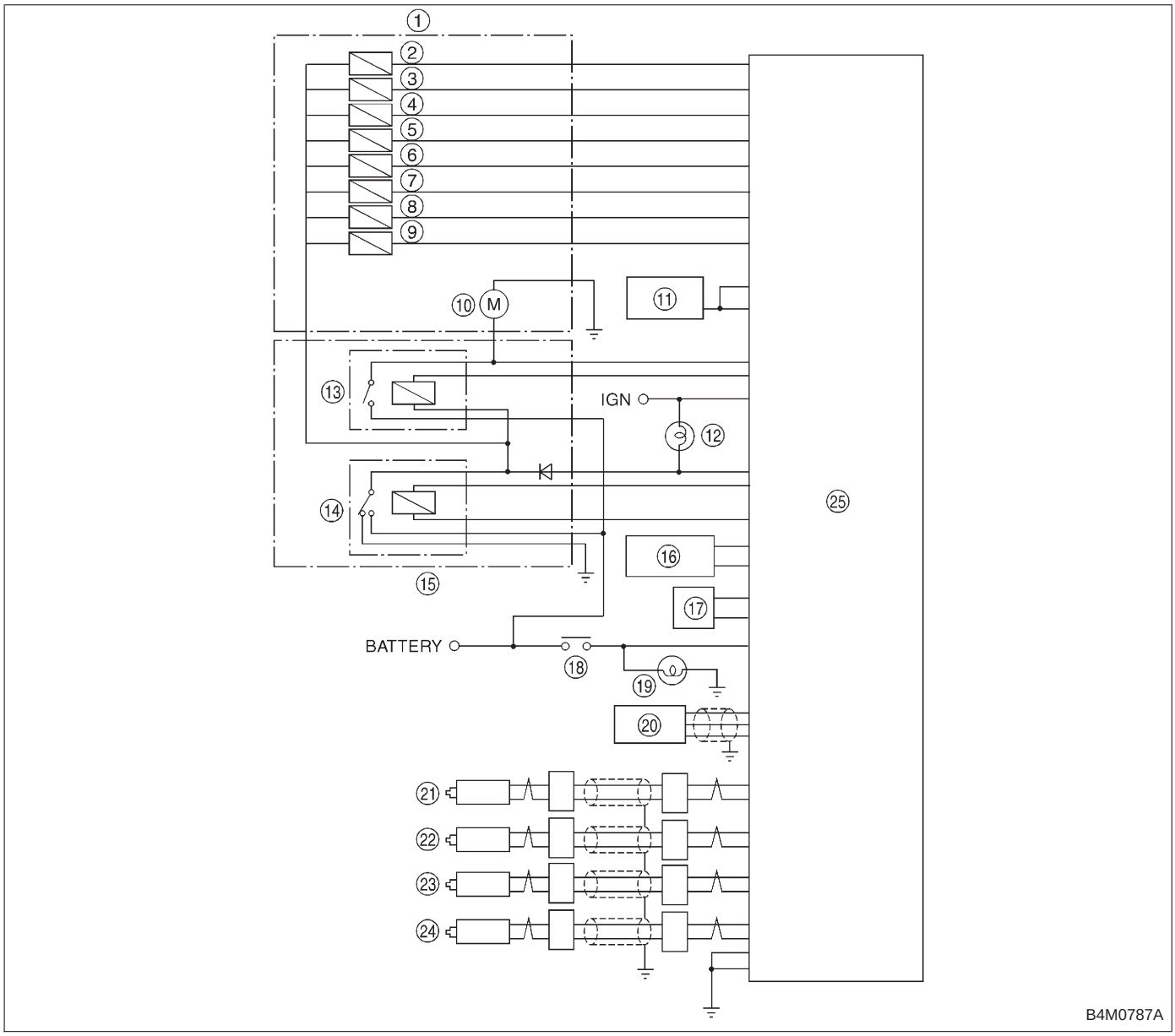
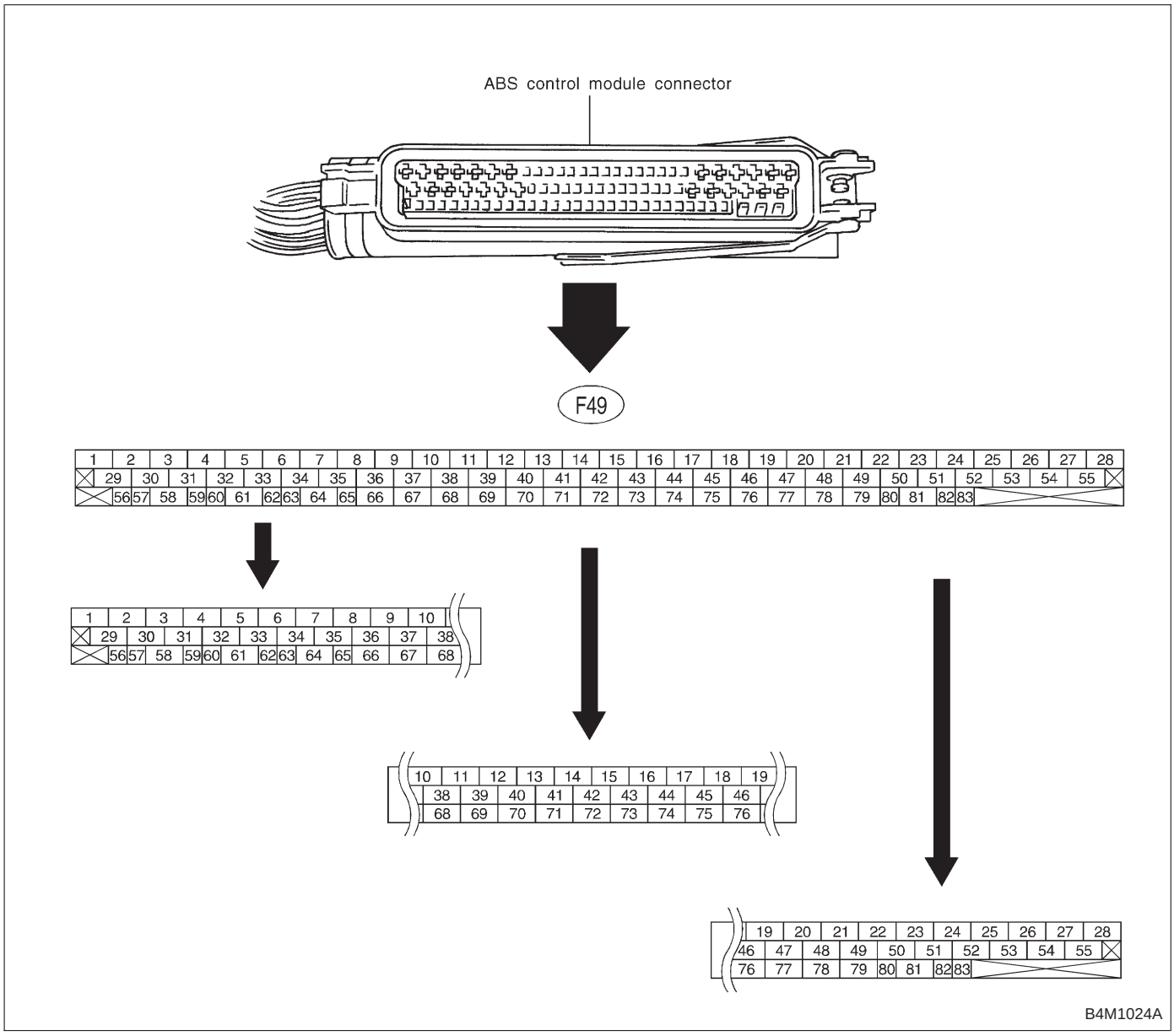
4. Schematic



① Hydraulic control unit (H/U)
② Front left inlet solenoid valve
③ Front left outlet solenoid valve
④ Front right inlet solenoid valve
⑤ Front right outlet solenoid valve
⑥ Rear left inlet solenoid valve
⑦ Rear left outlet solenoid valve
⑧ Rear right inlet solenoid valve
⑨ Rear right outlet solenoid valve
⑩ Motor
⑪ Transmission control module (only AT model)
⑫ ABS warning light
⑬ Motor relay
⑭ Valve relay
⑮ Relay box
⑯ Data link connector
⑰ Diagnosis connector
⑱ Stop light switch
⑲ Stop light
⑳ G sensor (only AWD model)
㉑ Front left ABS sensor
㉒ Front right ABS sensor
㉓ Rear left ABS sensor
㉔ Rear right ABS sensor
㉕ ABS control module (ABSCM)

5. Control Module I/O Signal

1. I/O SIGNAL VOLTAGE

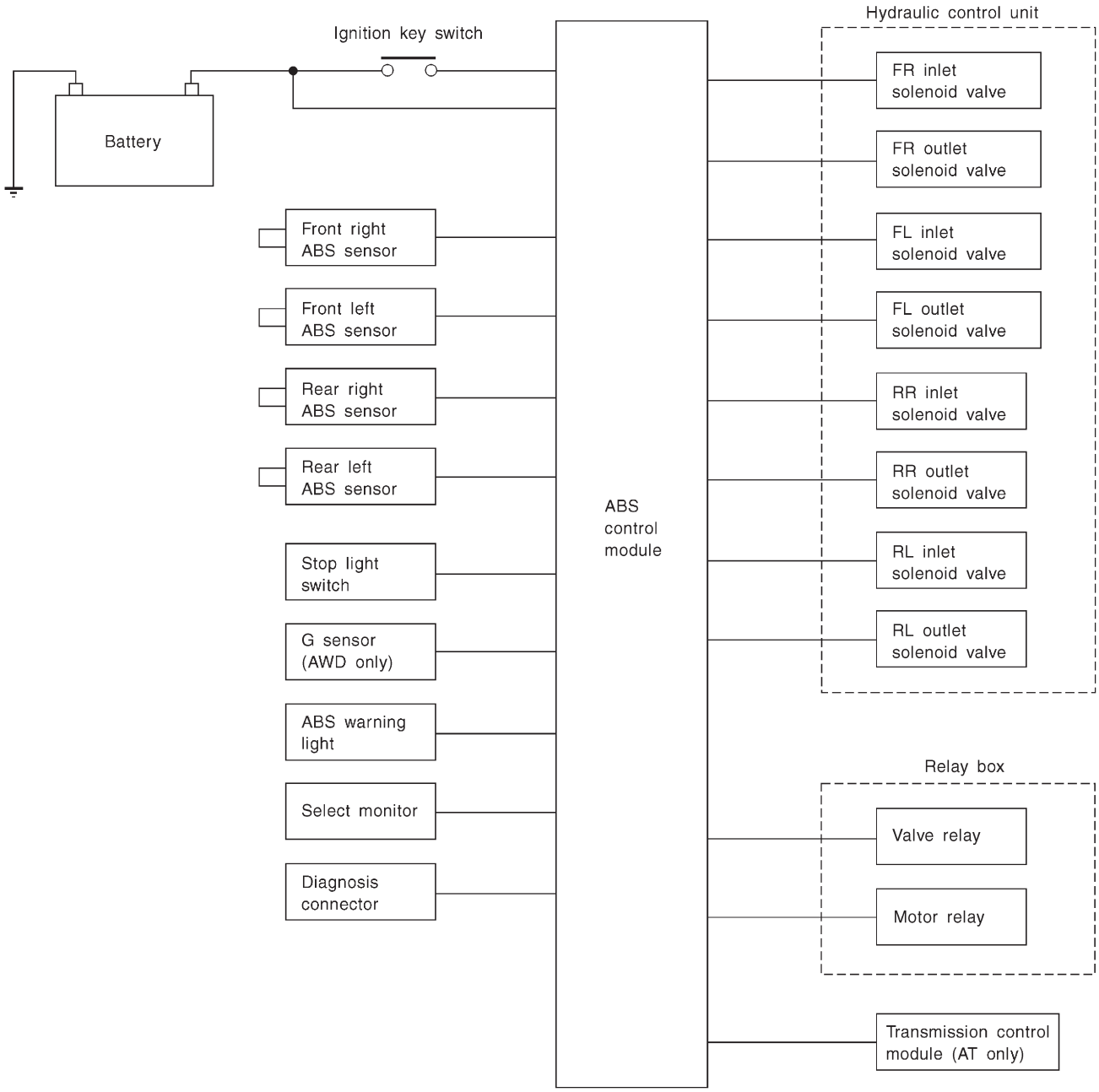


NOTE:

- The connector covers of LHD and RHD vehicles are in the reverse directions.
- The terminal numbers in the ABS control module connector are as shown in the figure.

Contents			Terminal No.	Input/Output signal Measured value and measuring conditions
ABS sensor (Wheel speed sensor)	Front left wheel		49—19	0.12 — 1 V (When it is 20 Hz.)
	Front right wheel		14—15	
	Rear left wheel		16—17	
	Rear right wheel		18—46	
Hydraulic control unit	Solenoid valve	Front left outlet	51—1	10 — 13 V when the valve is OFF and less than 1.5 V when the valve is ON.
		Front right outlet	3—1	
		Rear left outlet	4—1	
		Rear right outlet	50—1	
		Front left inlet	24—1	
		Front right inlet	30—1	
		Rear left inlet	31—1	
		Rear right inlet	23—1	
Relay box	Valve relay power supply		27—1	10 — 13 V when ignition switch is ON.
	Valve relay coil		47—1	Less than 1.5 V when ignition switch is ON.
	Motor relay coil		22—1	More than 10 V when the ABS control does not operate still and less than 1.5 V when ABS operates.
	Motor monitoring		10—1	Less than 1.5 V when the ABS control does not operate still and more than 10 V when ABS operates.
G sensor (AWD model only)	power supply		8—45	4.75 — 5.25 V
	ground		45	—
	output		7—45	2.3±0.2 V when vehicle is in horizontal position.
Stop light switch			36—1	Less than 1.5 V when the stop light is OFF and more than 4.5 V when the stop light is ON.
ABS warning light			54—1	Less than 1.5 V during 1.5 seconds when ignition switch is ON, and 10 — 14 V after 1.5 seconds.
AT ABS signal (AT model only)			12—1	Less than 1.5 V when the ABS control does not operate still and more than 5.5 V when ABS operates.
ABS operation signal monitor			39—1	Less than 1.5 V when the ABS control does not operate still and more than 5.5 V when ABS operates.
Select monitor	Data is received.		11—1	Less than 1.5 V when no data is received.
	Data is sent.		38—1	4.75 — 5.25 V when no data is sent.
Diagnosis connector	Terminal No. 3		5—1	10 — 14 V when ignition switch is ON.
	Terminal No. 6		13—1	10 — 14 V when ignition switch is ON.
Power supply			28—1	10 — 14 V when ignition switch is ON.
Grounding line			1	—
Grounding line			55	—

2. I/O SIGNAL DIAGRAM



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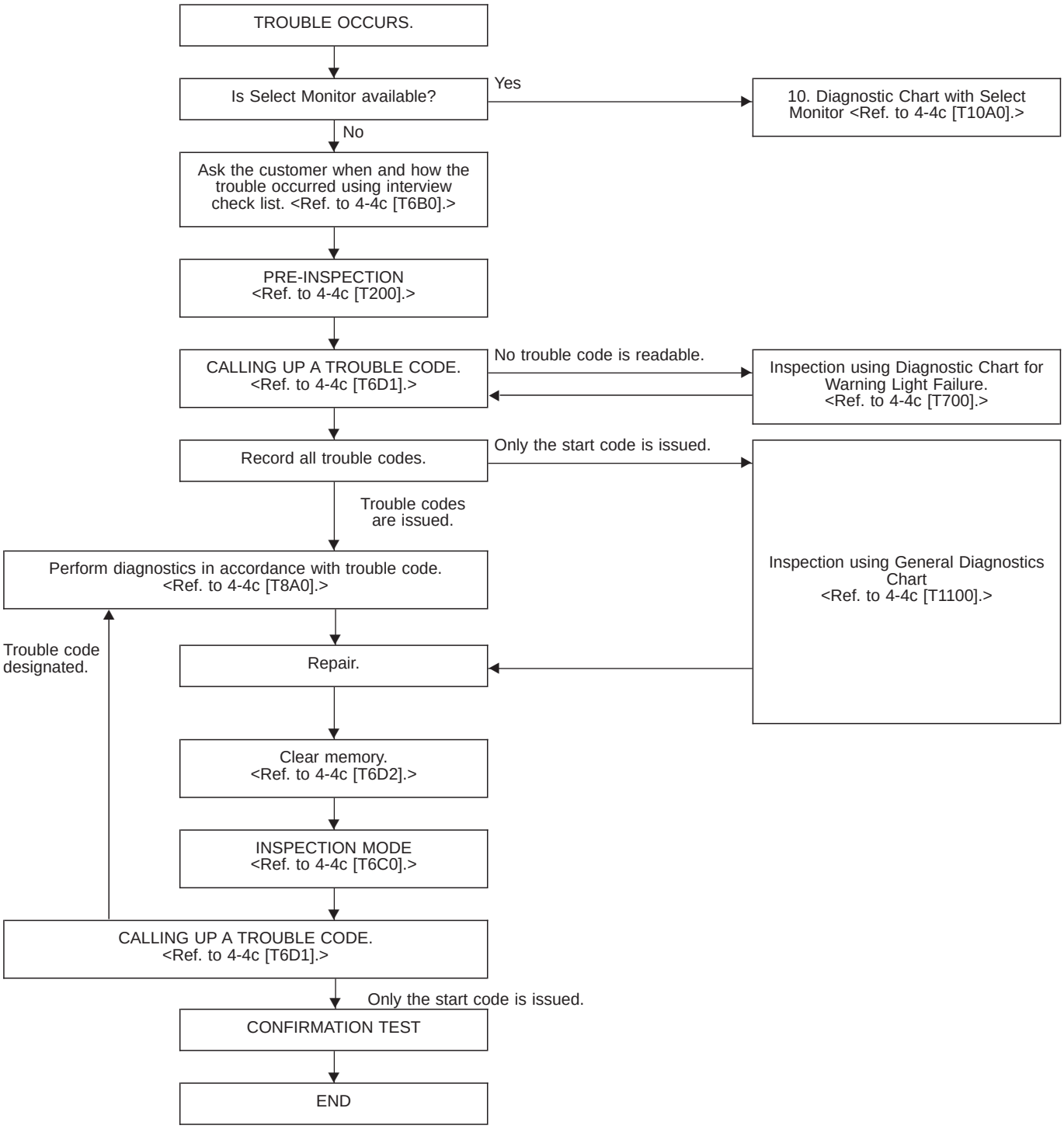
6. Diagnostics Chart for On-board Diagnosis System

A: BASIC DIAGNOSTICS PROCEDURE



NOTE:
- To check harness for broken wires or short circuits, shake it while holding it or the connector.
- When ABS warning light illuminates, read and record trouble code indicated by ABS warning light.

B: CHECK LIST FOR INTERVIEW

Check the following items about the vehicle's state.

1. THE STATE OF THE WARNING LIGHTS

a. ABS warning light	
① Is always on. ② Sometimes comes on. ③ Comes on only once. ④ Does not come on.	
When/how long does it come on?	
Ignition key position	① Lock ② Acc ③ On (before starting engine) ④ Start ⑤ On after starting (Engine: run) ⑥ On after starting (Engine: stop)
Timing	① Immediately after ignition is on. ② Immediately after ignition starts. ③ When advancing (Speed___miles/h →___miles/h) ④ While traveling at a constant speed (Speed___miles/h) ⑤ When decelerating (Speed___miles/h →___miles/h) ⑥ When turning (To right, to left, steering angle___deg., steering time___sec) ⑦ When moving other electrical parts (Part name:_____, Operating condition_____)

2. SYMPTOMS

ABS operating condition	① Performs no work. ② Operates only when abruptly applying brakes. (Conditions: vehicle speed___miles/h, how to step on brake pedal___) ③ Operating time (___sec., etc._____) ④ Operating noise (Produced/Not produced) ⑤ What kind of noise? (Knock, gong gong, bong, buzz, gong gong buzz, etc._____) ⑥ Reaction force of brake pedal (Stick, pressed down once with a clunk, pressed and released, etc._____)
Behavior of vehicle	① Directional stability cannot be obtained or steering arm refuses to work when applying brakes (vehicle turns to right, turns to left, spins, etc._____). ② Directional stability cannot be obtained or steering arm refuses to work when accelerating (vehicle turns to right, turns to left, spins, etc._____). ③ Brakes are out of order (braking distance is long, brakes lock or drag, pedal stroke is long, pedal sticks, etc._____). ④ Poor acceleration (fails to accelerate, engine stalls, etc._____). ⑤ Vibration, abnormal noise (operating noise is loud, noise is produced during operation from the front of vehicle (right, left) (tones:____), noise is produced during operation from the rear of vehicle (tones:____, others_____) ⑥ Other phenomena (concrete symptoms_____)

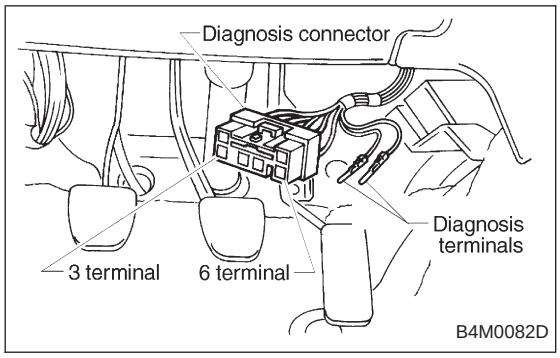
3. CONDITIONS UNDER WHICH TROUBLE OCCURS

Environment	① Weather (fine, cloudy, rain, snow, etc. ____) ② Ambient temperature (____°C/°F) ③ Road (urban area, suburbs, highway, general road, ascending slope, descending slope, paved road, gravel road, muddy road, sandy place, etc. ____) ④ Road surface (dry, wet, new-fallen snow, compressed snow, frozen slope, etc._____)
Conditions	① Brakes (deceleration___g, continuous/intermittent) ② Accelerator (acceleration___g, continuous/intermittent) ③ Travel speed (___miles, advancing, accelerating, reducing speed, low speed, turning, etc._____) ④ Condition of tire of each wheel (air pressure____, degree of wear____, whether or not genuine parts are used, whether or not chain is passed around tires, whether or not T tire is used.) others (_____) ⑤ Condition of suspension alignment (_____) ⑥ Loading state (_____)

4. REPAIRED PARTS ARE USED OR NOT

C: INSPECTION MODE

Reproduce the condition under which the problem has occurred as much as possible.
Drive the vehicle at a speed more than 40 km/h (25 MPH) for at least one minute.



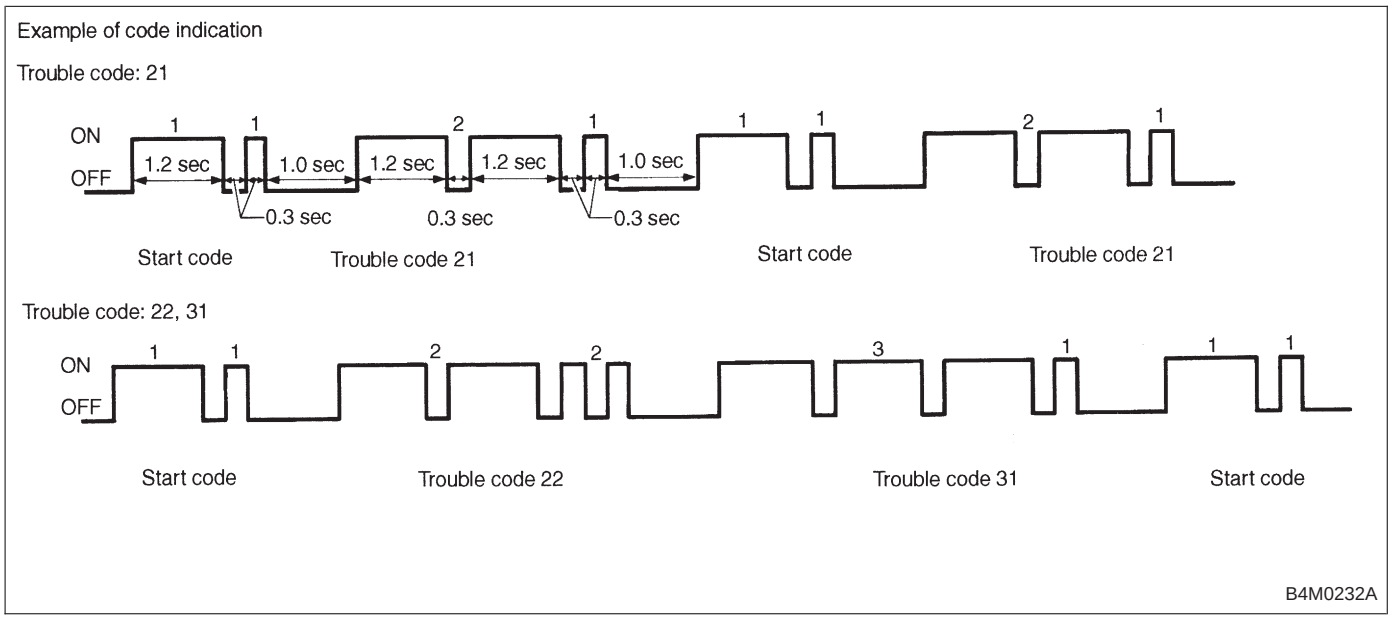
D: TROUBLE CODES

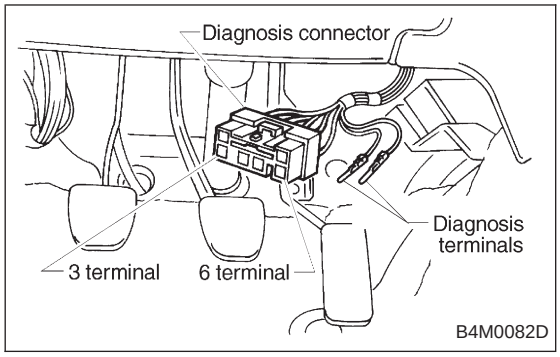
When on-board diagnosis of the ABS control module detects a problem, the information (up to a maximum of three) will be stored in the EEP ROM as a trouble code. When there are more than three, the most recent three will be stored. (Stored codes will stay in memory until they are cleared.)

1. CALLING UP A TROUBLE CODE

1) Take out diagnosis connector from side of driver's seat heater unit.
2) Turn ignition switch OFF.
3) Connect diagnosis connector terminal 6 to diagnosis terminal.
4) Turn ignition switch ON.
5) ABS warning light is set in the diagnostic mode and blinks to identify trouble code.
6) After the start code (11) is shown, the trouble codes will be shown in order of the last information first.
These repeat for a maximum of 5 minutes.

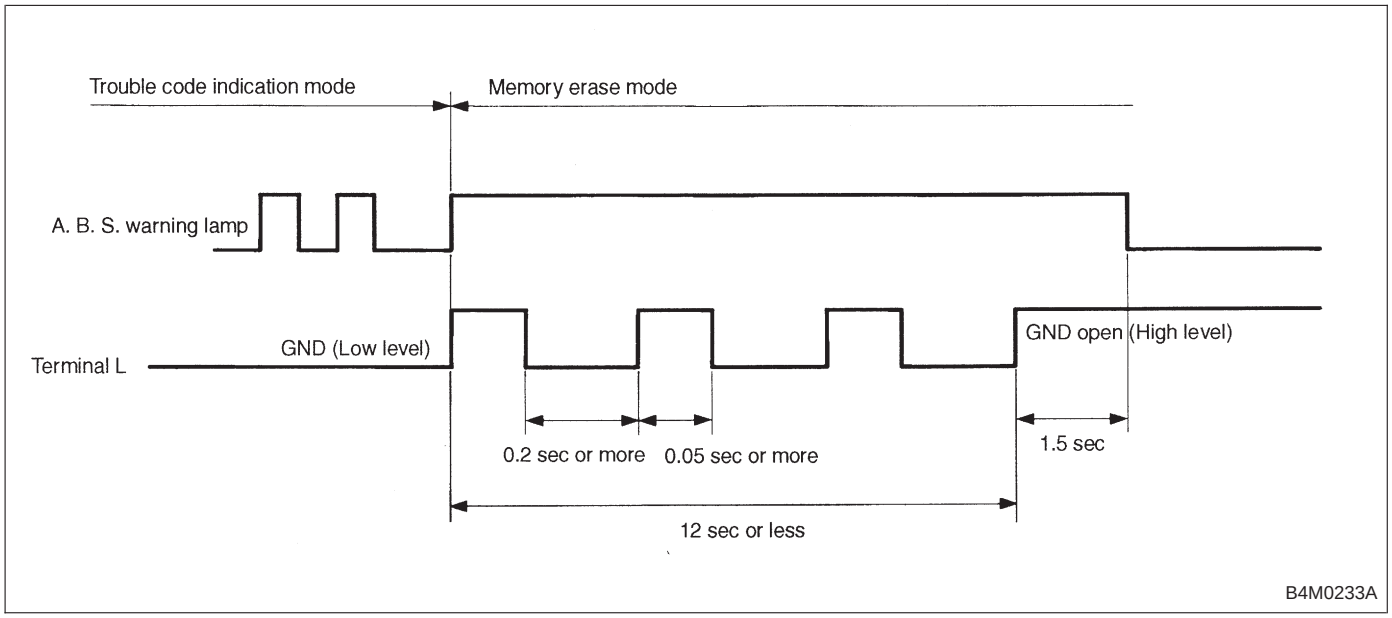
NOTE:
When there are no trouble codes in memory, only the start code (11) is shown.





2. CLEARING MEMORY

1) After calling up a trouble code, disconnect diagnosis connector terminal 6 from diagnosis terminal.
2) Repeat 3 times within approx. 12 seconds; connecting and disconnecting terminal 6 and diagnosis terminal for at least 0.05 seconds each time.



NOTE:
After diagnostics is completed, make sure to clear memory. Make sure only start code (11) is shown after memory is cleared.

7. Diagnostics Chart for ABS Warning Light Circuit and Diagnosis Circuit Failure

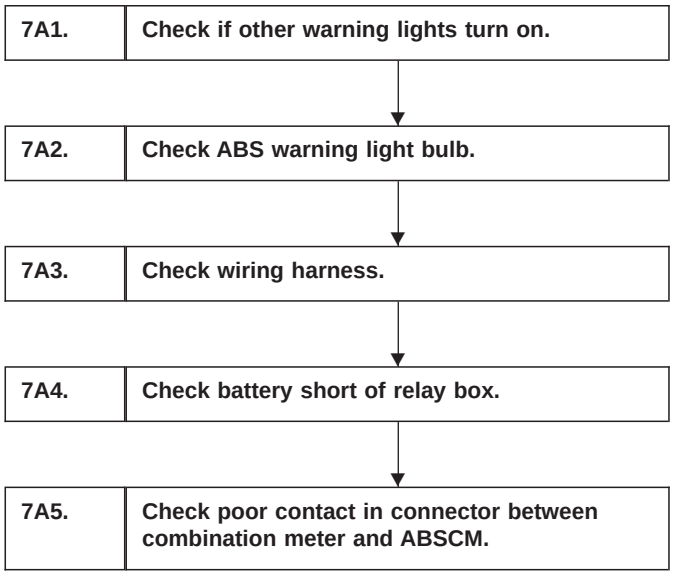
A: ABS WARNING LIGHT DOES NOT COME ON.

DIAGNOSIS:

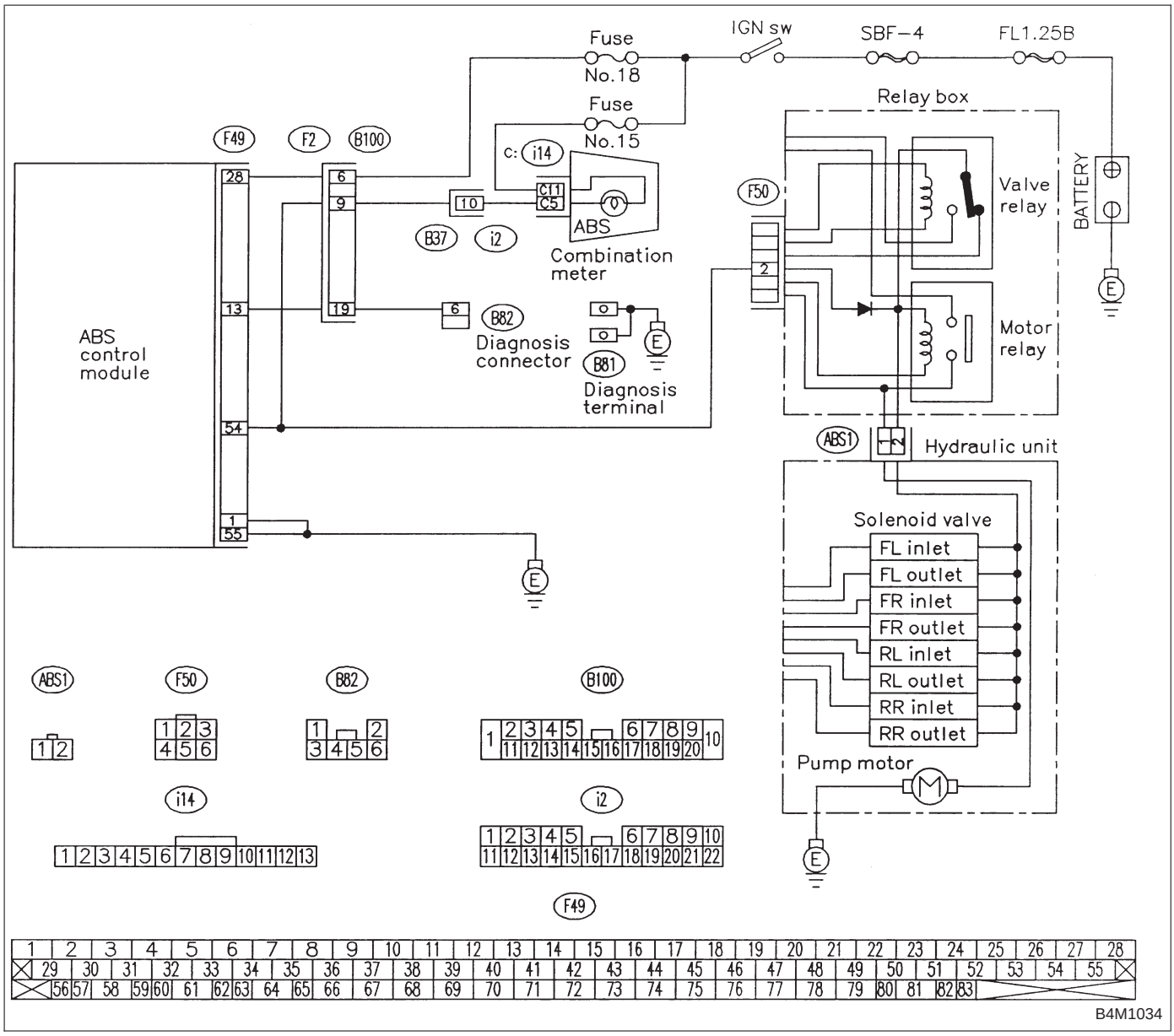
- ABS warning light circuit is open or shorted.

TROUBLE SYMPTOM:

- When ignition switch is turned ON (engine OFF), ABS warning light does not come on.



WIRING DIAGRAM:



7A1	CHECK IF OTHER WARNING LIGHTS TURN ON.

Turn ignition switch to ON (engine OFF).

CHECK ***: Do other warning lights turn on?***

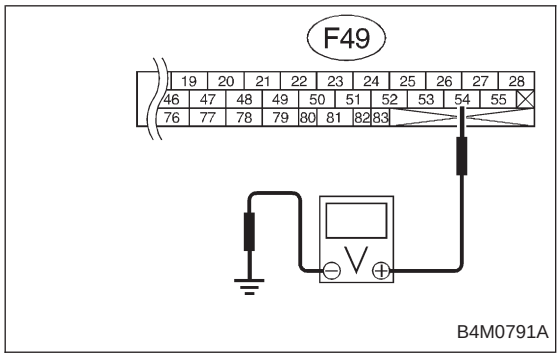
YES : Go to step **7A2.**

NO : Repair combination meter.

7A2	CHECK ABS WARNING LIGHT BULB.

1) Turn ignition switch to OFF.
2) Remove combination meter.
3) Remove ABS warning light bulb from combination meter.

CHECK ***: Is ABS warning light bulb OK?***
YES : Go to step **7A3.**
NO : Replace ABS warning light bulb.



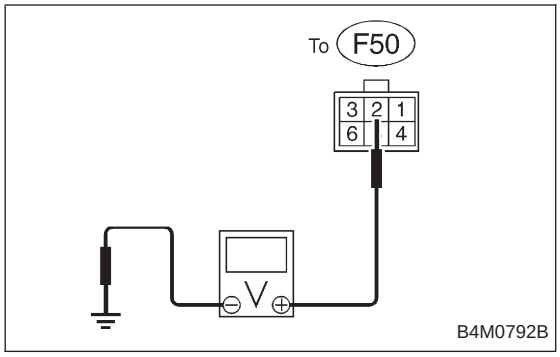
7A3	CHECK WIRING HARNESS.

1) Disconnect connector from ABSCM.
2) Disconnect connector (F50) from relay box.
3) Turn ignition switch to ON.
4) Measure voltage between connector (F49) and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 54 (+) — Chassis ground (−):
Is voltage 12 V?
YES : Go to next step.
NO : Repair broken wire in harness or connector.

5) Turn ignition switch to OFF.
6) Measure voltage between ABSCM connector (F49) and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 54 (+) — Chassis ground (−):
Is voltage less than 3 V?
YES : Go to step **7A4.**
NO : Repair battery short of harness.



7A4	CHECK BATTERY SHORT OF RELAY BOX.

1) Disconnect connector from relay box.
2) Turn ignition switch to ON.
3) Measure voltage between relay box and chassis ground.

CHECK ***: Connector & terminal***
To (F50) No. 2 (+) — Chassis ground (−):
Is voltage 0 V?

YES : Go to next step.
NO : Replace relay box.

4) Turn ignition switch OFF.
5) Measure voltage between relay box and chassis ground.

CHECK ***: Connector & terminal***
To (F50) No. 2 (+) — Chassis ground (−):
Is voltage 0 V?

YES : Go to step **7A5.**
NO : Replace relay box.

7A5	CHECK POOR CONTACT IN CONNECTOR BETWEEN COMBINATION METER AND ABSCM.

CHECK ***: Is there poor contact in connectors between combination meter and ABSCM?***

YES : Repair connector.
NO : Replace ABSCM.

B: ABS WARNING LIGHT DOES NOT GO OFF.

DIAGNOSIS:

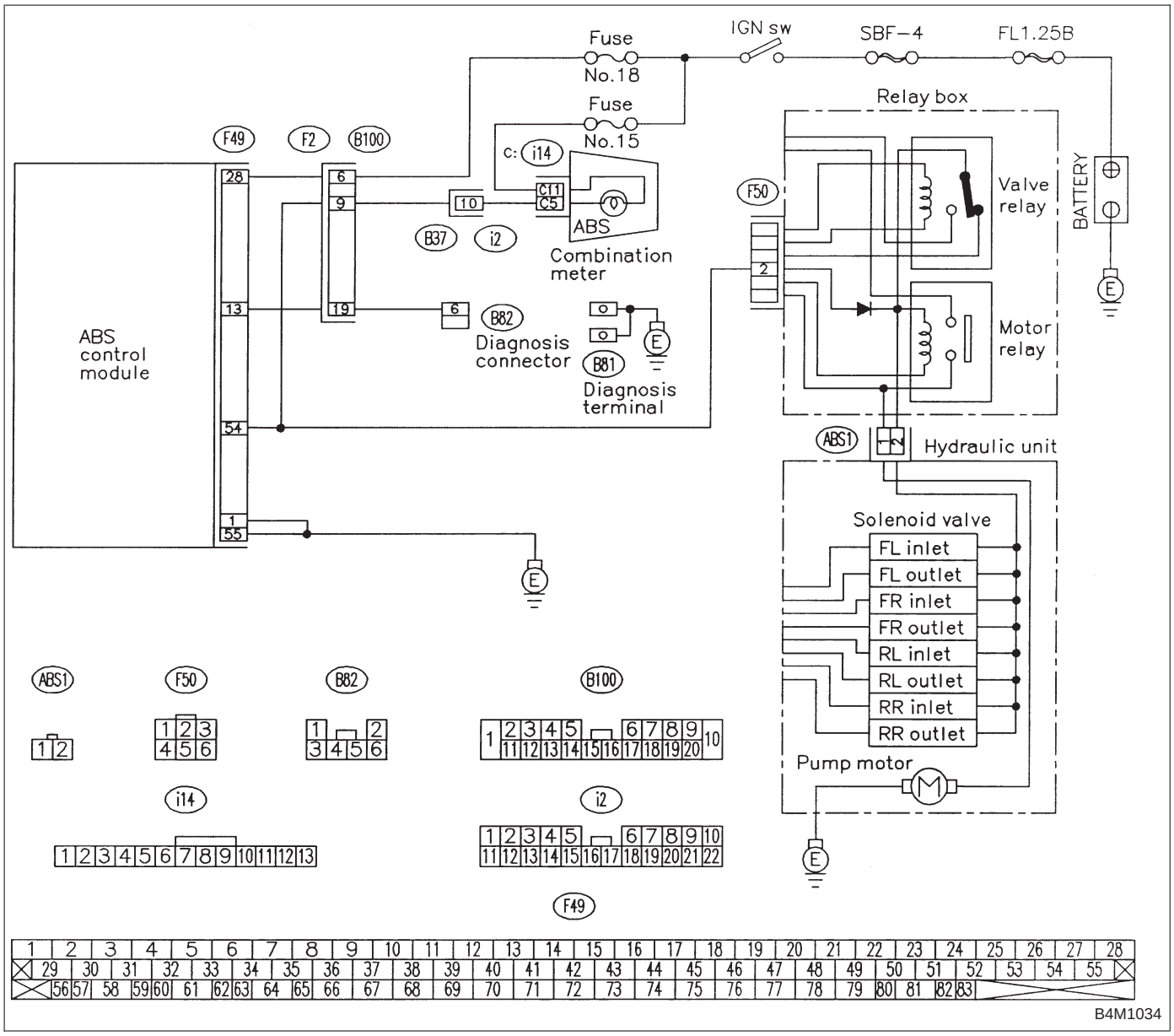
- ABS warning light circuit is open or shorted.

TROUBLE SYMPTOM:

- When starting the engine and while ABS warning light is kept ON.

7B1.	Check installation of ABSCM connector.
7B2.	Check generator.
7B3.	Check battery terminal.
7B4.	Check power supply of ABSCM.
7B5.	Check ground circuit of ABSCM.
7B6.	Check wiring harness.
7B7.	Check relay box.
7B8.	Check valve relay.
7B9.	Check hydraulic control unit.
7B10.	Check diagnosis terminal.
7B11.	Check diagnosis line.
7B12.	Check poor contact in ABSCM connector.

WIRING DIAGRAM:



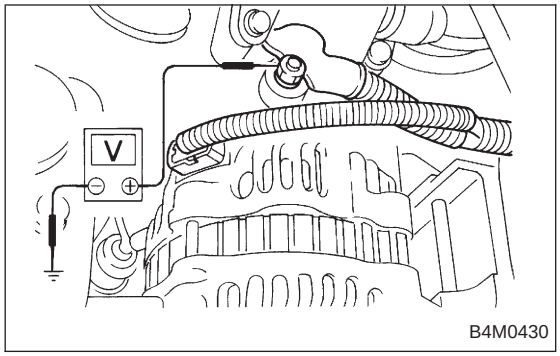
7B1	CHECK INSTALLATION OF ABSCM CONNECTOR.

Turn ignition switch to OFF.

CHECK ***: Is ABSCM connector inserted into ABSCM until the clamp locks onto it?***

YES : Go to step **7B2.**

NO : Insert ABSCM connector into ABSCM until the clamp locks onto it.



7B2	CHECK GENERATOR.

1) Start the engine.
2) Idle the engine.
3) Measure voltage between generator and chassis ground.

CHECK : ***Terminal***
Generator B terminal (+) — Chassis ground (−):
Is voltage 10 — 15 V?

YES : Go to step **7B3.**

NO : Repair generator.

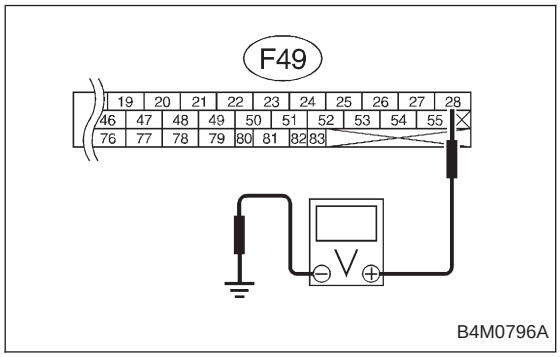
7B3	CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

CHECK : ***Is there poor contact at battery terminal?***

YES : Repair battery terminal.

NO : Go to step **7B4.**



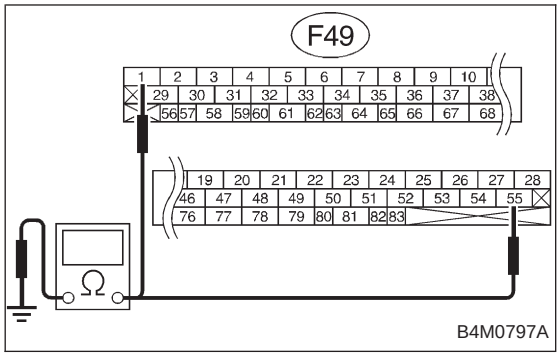
7B4	CHECK POWER SUPPLY OF ABSCM.

1) Disconnect connector from ABSCM.
2) Start engine.
3) Idle the engine.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 28 (+) — Chassis ground (−):
Is voltage 10 — 15 V?

YES : Go to step **7B5.**

NO : Repair ABSCM power supply circuit.



7B5	CHECK GROUND CIRCUIT OF ABSCM.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 1 — Chassis ground:
(F49) No. 55 — Chassis ground:
Is resistance less than 0.5 Ω?

YES : Go to step **7B6.**

NO : Repair ABSCM ground harness.

7B6	CHECK WIRING HARNESS.

1) Disconnect connector (F50) from relay box.
2) Turn ignition switch to ON.

CHECK ***: Does the ABS warning light remain off?***

YES : Go to step **7B7.**

NO : Repair front wiring harness.

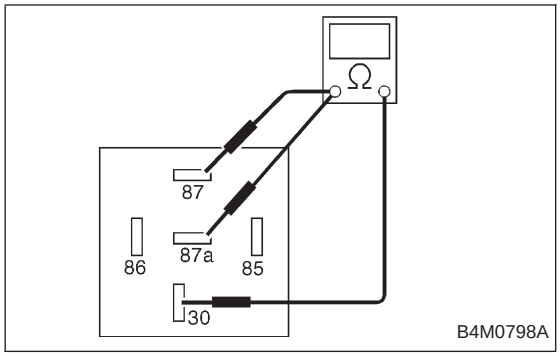
7B7	CHECK RELAY BOX.

1) Turn ignition switch to OFF.
2) Connect connector (F50) to relay box.
3) Remove valve relay from relay box.
4) Disconnect connector (ABS1) from hydraulic control unit.
5) Turn ignition switch to ON.

CHECK ***: Does the ABS warning light remain off?***

YES : Go to step **7B8.**

NO : Repair relay box and check fuse.



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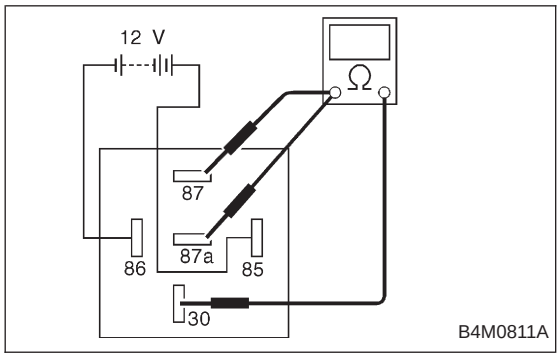


B4M0811A

7B8	CHECK VALVE RELAY.

1) Measure resistance between valve relay terminal and terminal.

CHECK ***: Terminals***
No. 30 — No. 87:
Is resistance more than 1 MΩ?
No. 30 — No. 87a:
Is resistance less than 0.5 Ω?

YES : Go to next step.

NO : Replace valve relay.

2) Connect battery to valve relay terminal No. 85 and No. 86.

3) Measure resistance between valve relay terminals.

CHECK ***: Terminals***
No. 30 — No. 87:
Is resistance less than 0.5 Ω?
No. 30 — No. 87a:
Is resistance more than 1 MΩ?

YES : Go to step **7B9.**

NO : Replace valve relay.

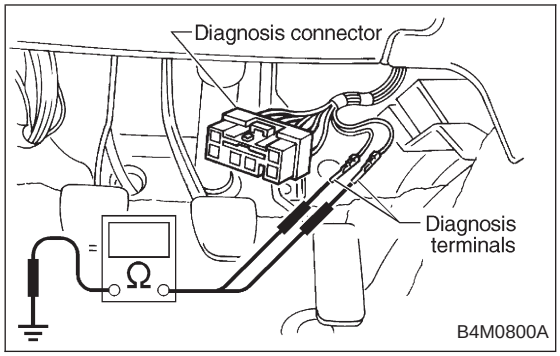
7B9	CHECK HYDRAULIC CONTROL UNIT.

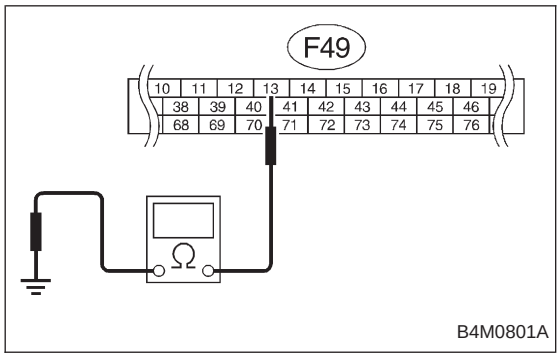
1) Turn ignition switch to OFF.
2) Connect connector (ABS1) to hydraulic control unit.
3) Turn ignition switch to ON.

CHECK ***: Is the ABS warning light off?***

YES : Go to step **7B10.**

NO : Replace hydraulic control unit and check fuse No. 19.





7B10	CHECK DIAGNOSIS TERMINAL.

Measure resistance between diagnosis terminals (B81) and chassis ground.

CHECK ***: Terminals***
Diagnosis terminal (A) — Chassis ground:
Diagnosis terminal (B) — Chassis ground:
Is the resistance less than 1 Ω?

YES : Go to step **7B11.**

NO : Repair diagnosis terminal harness.

7B11	CHECK DIAGNOSIS LINE.

1) Turn ignition switch to OFF.
2) Connect diagnosis terminal to diagnosis connector (B82) No. 6.
3) Disconnect connector from ABSCM.
4) Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 13 — Chassis ground:
Is the resistance less than 1 Ω?

YES : Go to step **7B12.**

NO : Repair harness connector between ABSCM and diagnosis connector.

7B12	CHECK POOR CONTACT IN ABSCM CONNECTOR.

CHECK ***: Is there poor contact in ABSCM connector?***

YES : Repair connector.

NO : Replace ABSCM.

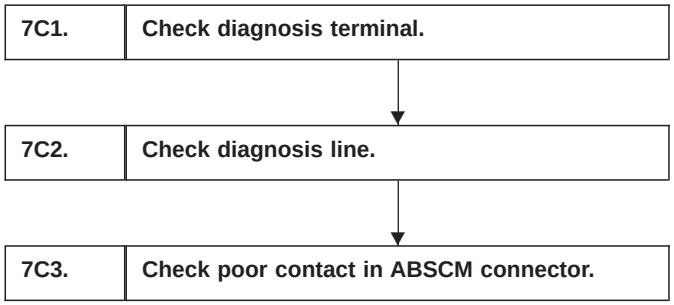
C: TROUBLE CODE DOES NOT APPEAR.

DIAGNOSIS:

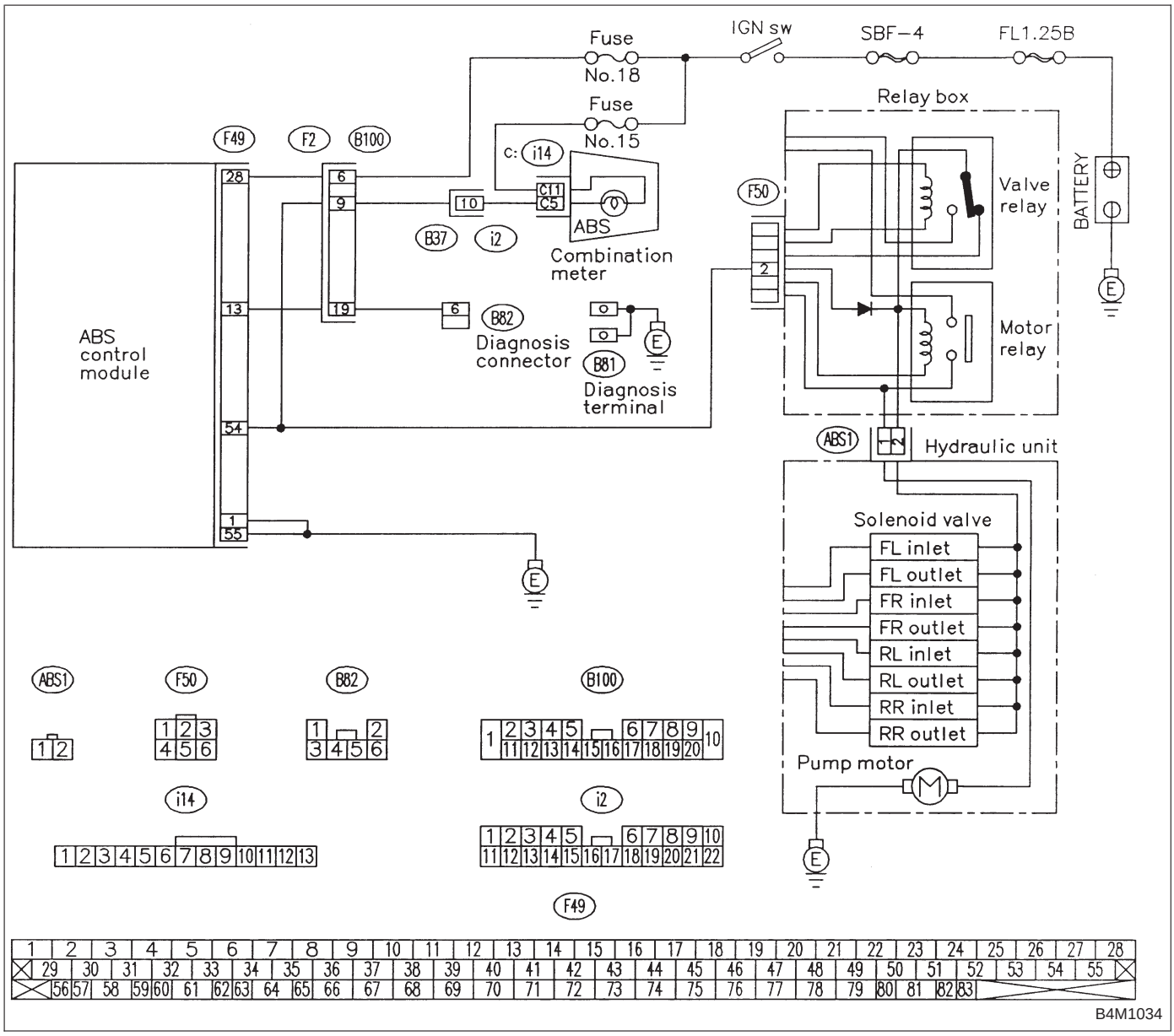
- Diagnosis circuit is open.

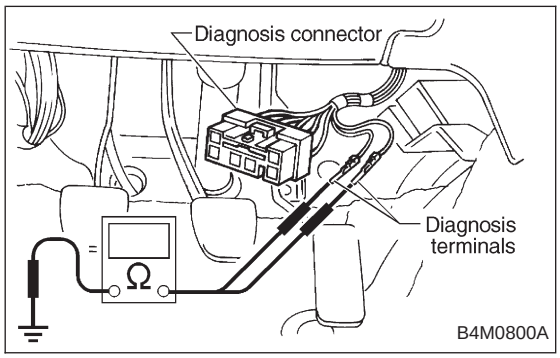
TROUBLE SYMPTOM:

- The ABS warning light turns on or off normally but the start code cannot be read out in the diagnostic mode.



WIRING DIAGRAM:





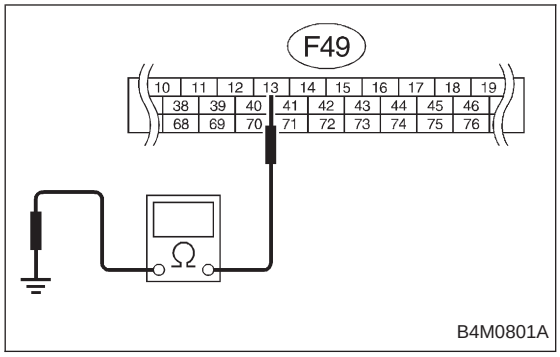
7C1	CHECK DIAGNOSIS TERMINAL.

Measure resistance between diagnosis terminals (B81) and chassis ground.

CHECK : ***Terminals***
Diagnosis terminal (A) — Chassis ground:
Diagnosis terminal (B) — Chassis ground:
Is the resistance less than 0.5 Ω?

YES : Go to step **7C2.**

NO : Repair diagnosis terminal harness.



7C2	CHECK DIAGNOSIS LINE.

1) Turn ignition switch to OFF.
2) Connect diagnosis terminal to diagnosis connector (B82) No. 6.
3) Disconnect connector from ABSCM.
4) Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal (F49) No. 13 — Chassis ground: Is the resistance less than 0.5 Ω?***

YES : Go to step **7C3.**

NO : Repair harness connector between ABSCM and diagnosis connector.

7C3	CHECK POOR CONTACT IN ABSCM CONNECTOR.

CHECK ***: Is there poor contact in ABSCM connector?***

YES : Repair connector.

NO : Replace ABSCM.

8. Diagnostics Chart with Trouble Code

A: LIST OF TROUBLE CODE

Trouble code	Contents of diagnosis		Ref. to
11	Start code ● Trouble code is shown after start code. ● Only start code is shown in normal condition.		—
21	Abnormal ABS sensor (Open circuit or input voltage too high)	Front right ABS sensor	4-4c [T8B0]
23		Front left ABS sensor	
25		Rear right ABS sensor	
27		Rear left ABS sensor	
22	Abnormal ABS sensor (Abnormal ABS sensor signal)	Front right ABS sensor	4-4c [T8C0]
24		Front left ABS sensor	
26		Rear right ABS sensor	
28		Rear left ABS sensor	
29		Any one of four	4-4c [T8D0]
31	Abnormal solenoid valve circuit(s) in hydraulic unit	Front right inlet valve	4-4c [T8E0]
32		Front right outlet valve	4-4c [T8F0]
33		Front left inlet valve	4-4c [T8E0]
34		Front left outlet valve	4-4c [T8F0]
35		Rear right inlet valve	4-4c [T8E0]
36		Rear right outlet valve	4-4c [T8F0]
37		Rear left inlet valve	4-4c [T8E0]
38		Rear left outlet valve	4-4c [T8F0]
41	Abnormal ABS control module		4-4c [T8G0]
42	Source voltage is low.		4-4c [T8H0]
44	A combination of AT control abnormals		4-4c [T8I0]
46	Abnormal G sensor power supply voltage		4-4c [T8J0]
51	Abnormal valve relay		4-4c [T8K0]
52	Abnormal motor and/or motor relay		4-4c [T8L0]
54	Abnormal stop light switch		4-4c [T8M0]
56	Abnormal G sensor output voltage		4-4c [T8N0]

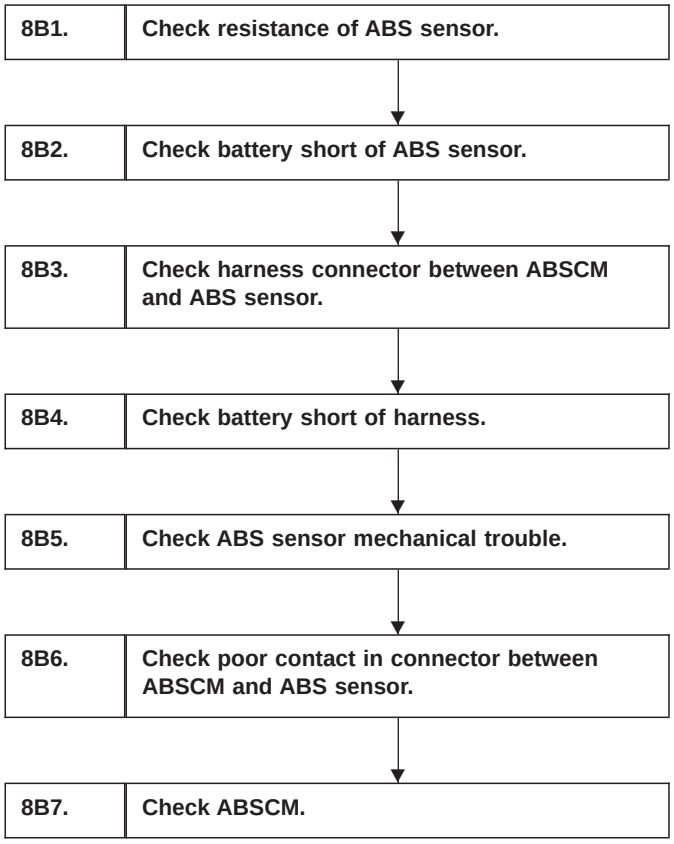
B: TROUBLE CODE 21 (FRONT RH)
TROUBLE CODE 23 (FRONT LH)
TROUBLE CODE 25 (REAR RH)
TROUBLE CODE 27 (REAR LH)
— ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —

DIAGNOSIS:

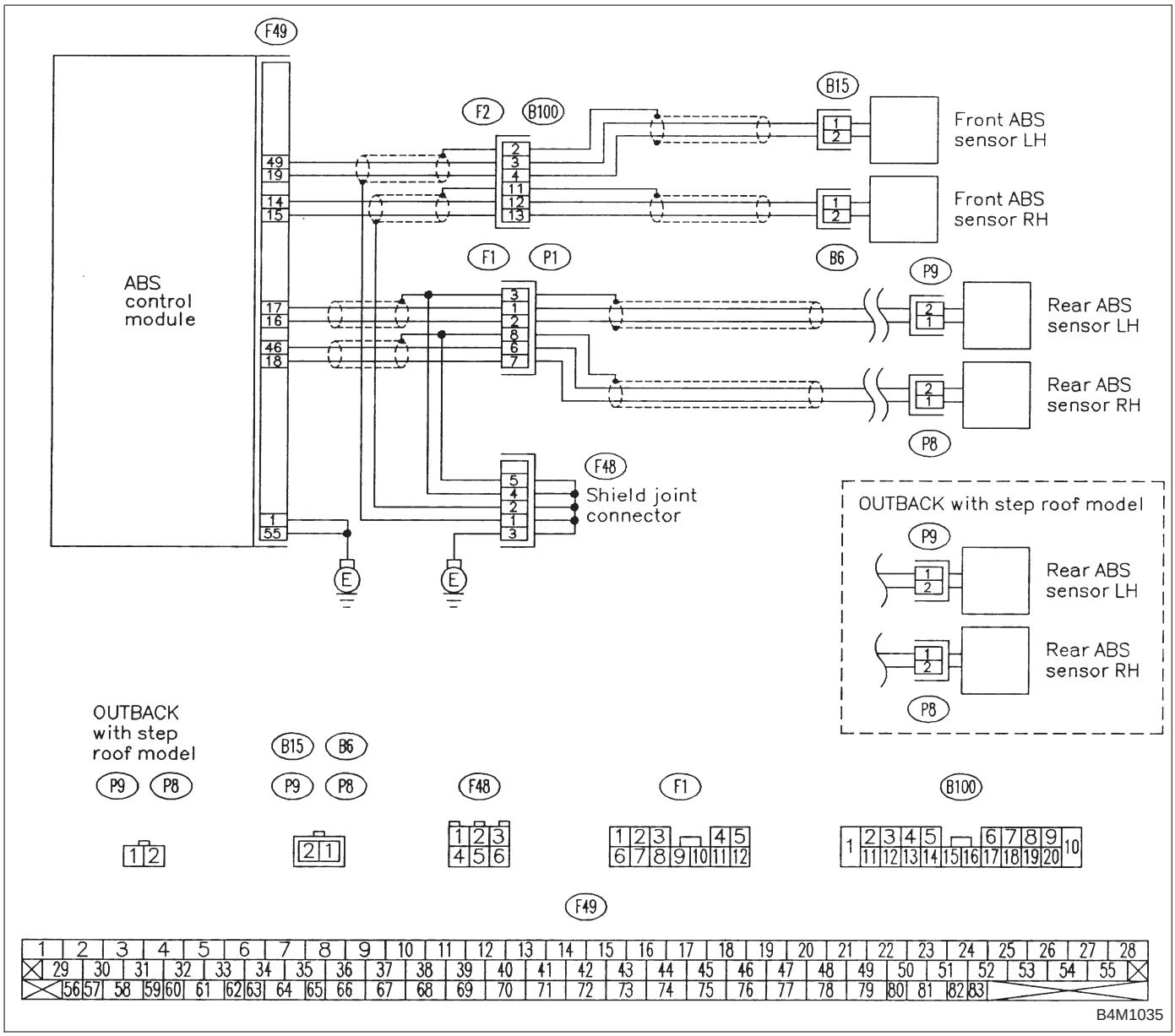
- Faulty ABS sensor (Broken wire, input voltage too high)
- Faulty harness connector

TROUBLE SYMPTOM:

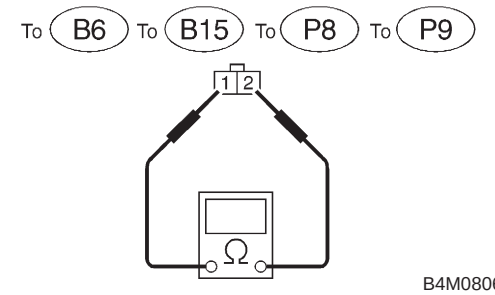
- ABS does not operate.



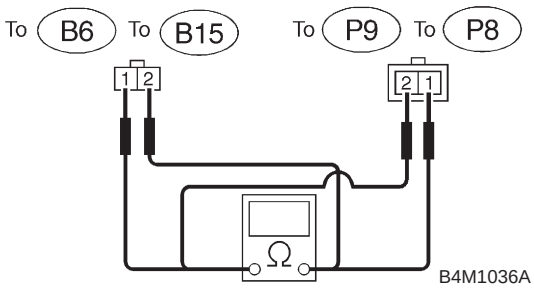
WIRING DIAGRAM:



Except OUTBACK with step roof model



OUTBACK with step roof model



8B1	CHECK RESISTANCE OF ABS SENSOR.

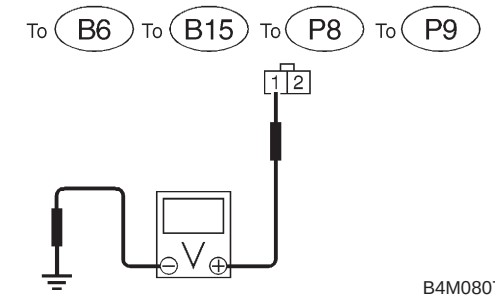
1) Turn ignition switch to OFF.
2) Disconnect connector from ABS sensor.
3) Measure resistance of ABS sensor connector terminals.

CHECK : ***Trouble code/Connector & terminal***
21/to (B6) No. 1 — No. 2
23/to (B15) No. 1 — No. 2
25/to (P8) No. 1 — No. 2
27/to (P9) No. 1 — No. 2
Is resistance 0.8 — 1.2 kΩ?

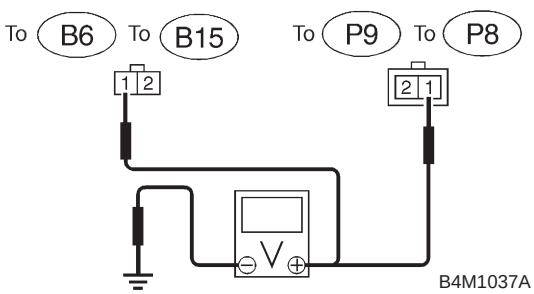
YES : Go to step **8B2.**

NO : Replace ABS sensor.

Except OUTBACK with step roof model



OUTBACK with step roof model



8B2	CHECK BATTERY SHORT OF ABS SENSOR.

1) Disconnect connector from ABSCM.
2) Turn ignition switch to ON.
3) Measure voltage between ABS sensor and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
21/to (B6) No. 1 (+) — Chassis ground (−)
23/to (B15) No. 1 (+) — Chassis ground (−)
25/to (P8) No. 1 (+) — Chassis ground (−)
27/to (P9) No. 1 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

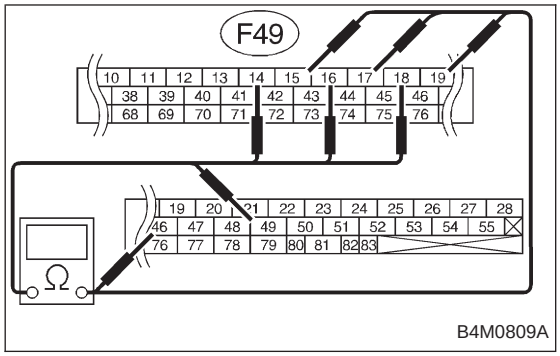
NO : Replace ABS sensor.

4) Turn ignition switch to OFF.
5) Measure voltage between ABS sensor and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
21/to (B6) No. 1 (+) — Chassis ground (−)
23/to (B15) No. 1 (+) — Chassis ground (−)
25/to (P8) No. 1 (+) — Chassis ground (−)
27/to (P9) No. 1 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8B3.**

NO : Replace ABS sensor.



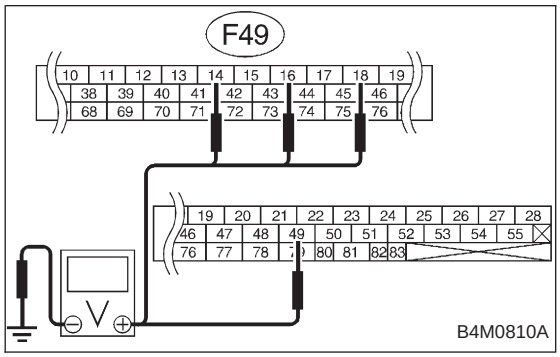
8B3	CHECK HARNESS CONNECTOR BETWEEN ABSCM AND ABS SENSOR.

1) Connect connector to ABS sensor.
2) Measure resistance between ABSCM connector terminals.

CHECK : ***Trouble code/Connector & terminal***
21/(F49) No. 14 — No. 15
23/(F49) No. 49 — No. 19
25/(F49) No. 18 — No. 46
27/(F49) No. 16 — No. 17
Is resistance 0.8 — 1.2 kΩ?

YES : Go to step **8B4.**

NO : Repair harness connector between ABSCM and ABS sensor.



8B4	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
21/(F49) No. 14 (+) — Chassis ground (−)
23/(F49) No. 49 (+) — Chassis ground (−)
25/(F49) No. 18 (+) — Chassis ground (−)
27/(F49) No. 16 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

NO : Repair harness between ABSCM and ABS sensor.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
21/(F49) No. 14 (+) — Chassis ground (−)
23/(F49) No. 49 (+) — Chassis ground (−)
25/(F49) No. 18 (+) — Chassis ground (−)
27/(F49) No. 16 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8B5.**

NO : Repair harness between ABSCM and ABS sensor.

8B5	CHECK ABS SENSOR MECHANICAL TROUBLE.

CHECK : ***Tightening torque:***
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)
Are the ABS sensor installation bolts tightened securely?

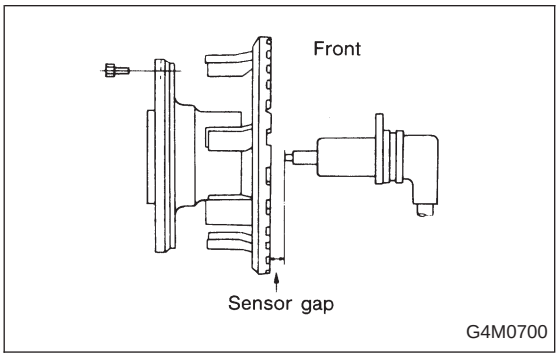
YES : Go to next CHECK .

NO : Tighten ABS sensor installation bolts securely.

CHECK : ***Tightening torque:***
13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)
Are the tone wheel installation bolts tightened securely?

YES : Go to next step.

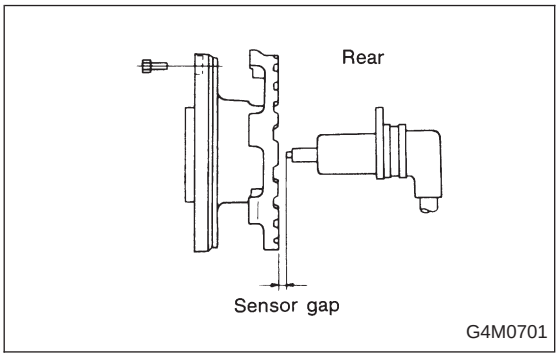
NO : Tighten tone wheel installation bolts securely.



1) Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.

CHECK : ***Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)



YES : Go to next step.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

2) Measure hub runout.

CHECK : ***Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **8B6.**

NO : Repair hub.

8B6	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND ABS SENSOR.

CHECK : ***Is there poor contact in connectors between ABSCM and ABS sensor?***

YES : Repair connector.

NO : Go to step **8B7.**

8B7	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

NOTE:
Check harness and connectors between ABSCM and ABS sensor.

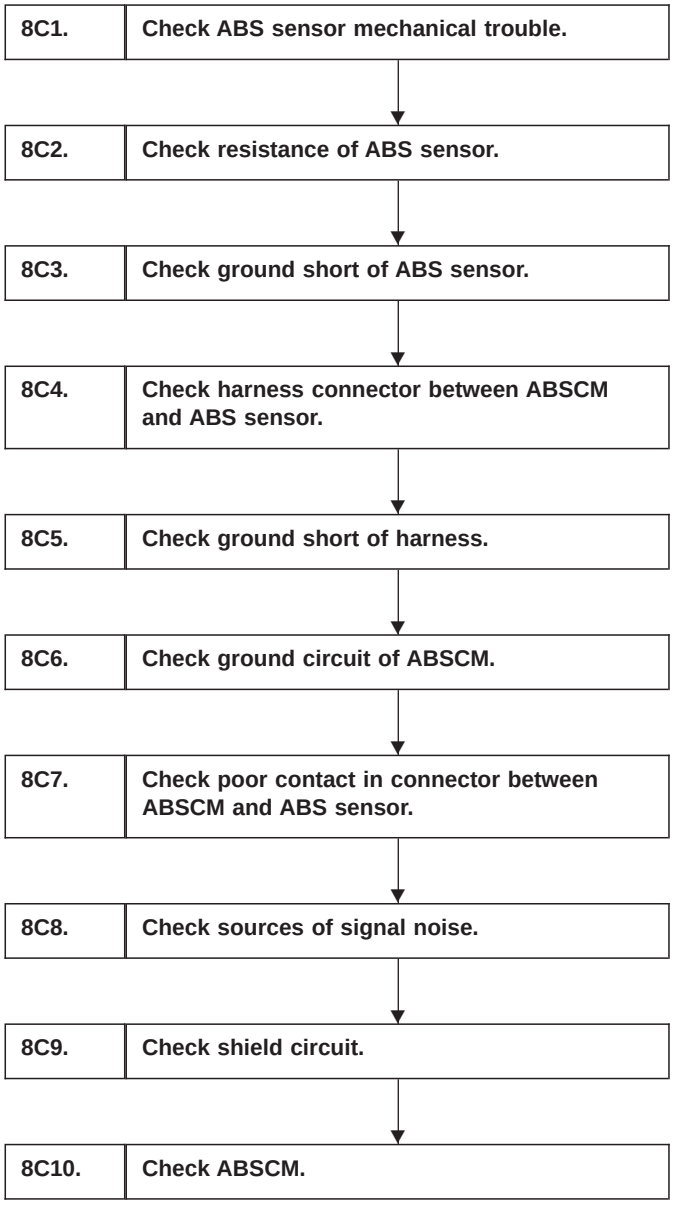
C: TROUBLE CODE 22 (FRONT RH) TROUBLE CODE 24 (FRONT LH) TROUBLE CODE 26 (REAR RH) TROUBLE CODE 28 (REAR LH) — ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —

DIAGNOSIS:

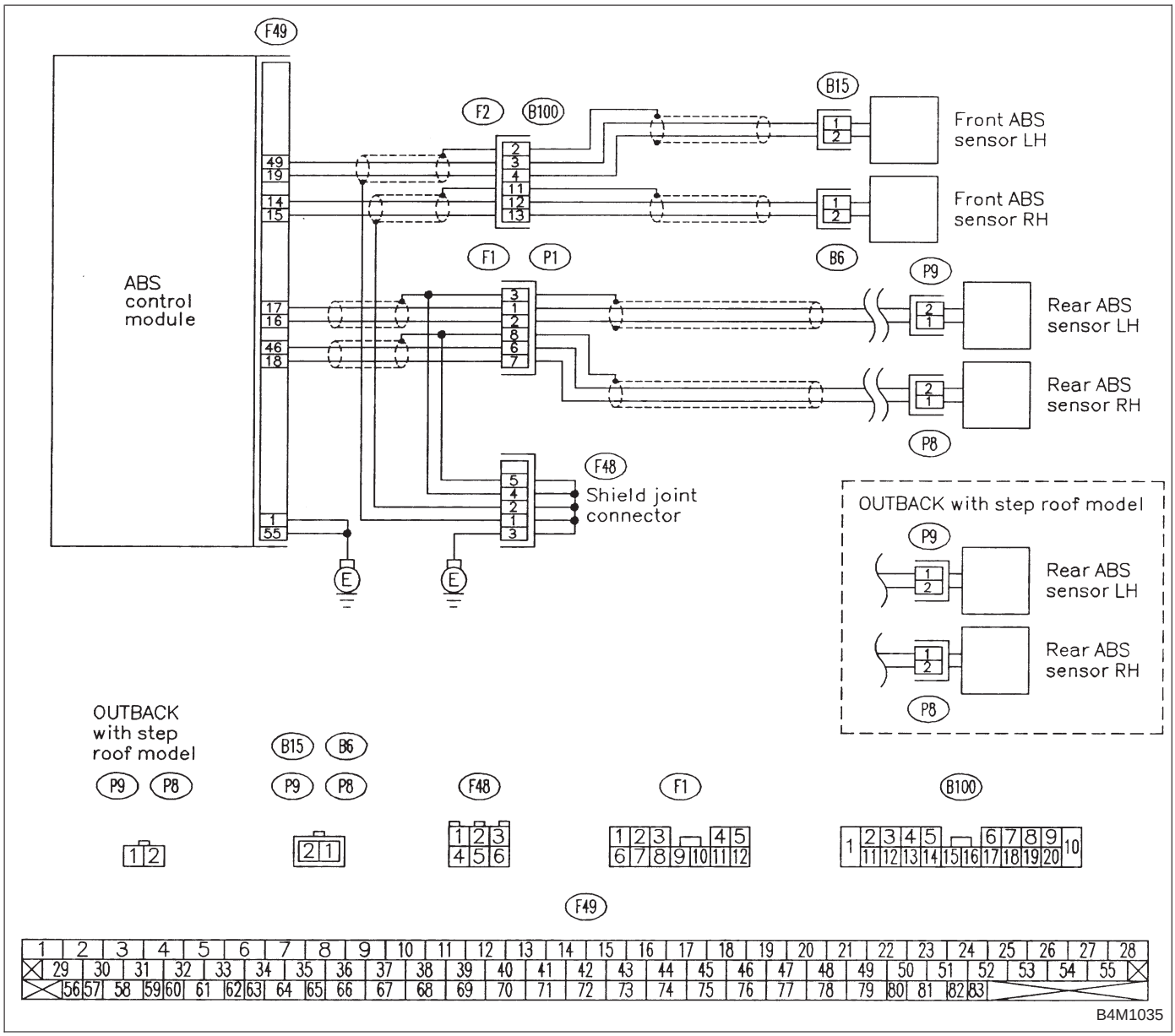
- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector

TROUBLE SYMPTOM:

- ABS does not operate.



WIRING DIAGRAM:



8C1	CHECK ABS SENSOR MECHANICAL TROUBLE.

CHECK : ***Tightening torque:***
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)
Are the ABS sensor installation bolts tightened securely?

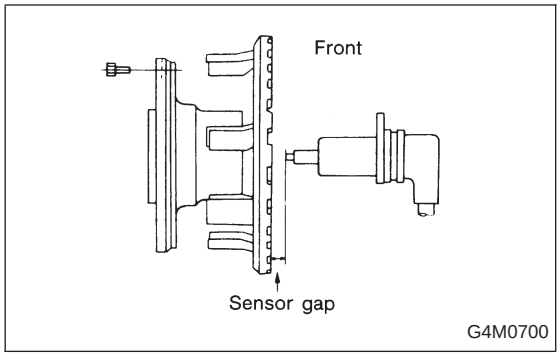
YES : Go to next CHECK .

NO : Tighten ABS sensor installation bolts securely.

CHECK : ***Tightening torque:***
13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)
Are the tone wheel installation bolts tightened securely?

YES : Go to next step.

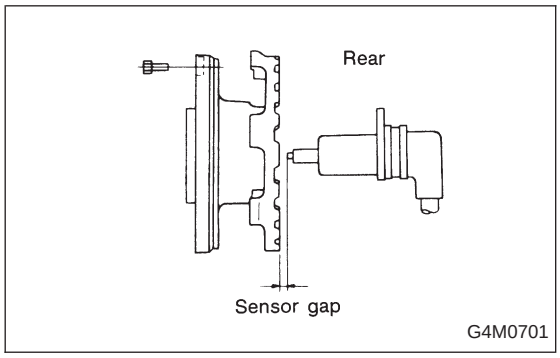
NO : Tighten tone wheel installation bolts securely.



1) Measure tone wheel to pole piece gap over entire perimeter of the wheel.

CHECK ***: Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)



YES : Go to next CHECK .

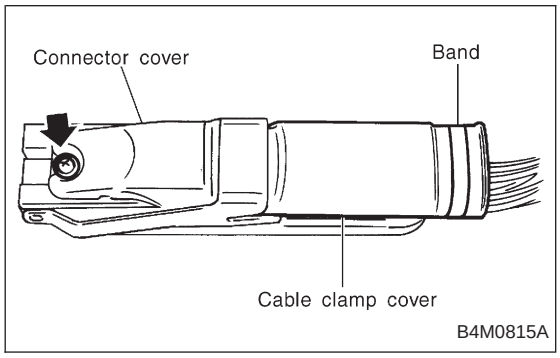
NO : Adjust the gap.

NOTE:
Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

CHECK ***: Is an oscilloscope available?***

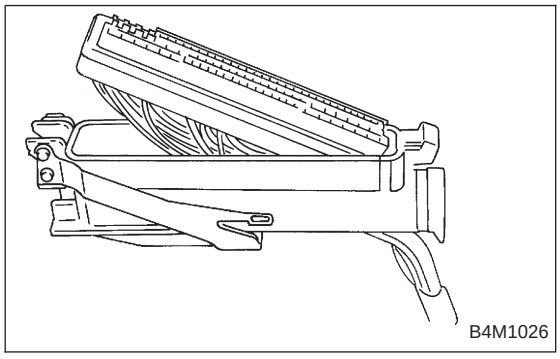
YES : Go to next step.

NO : Go to step 13).

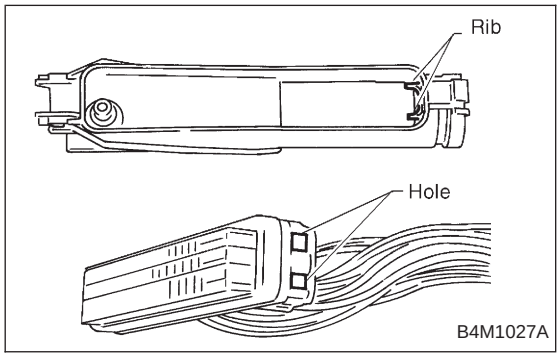


2) Raise all four wheels of ground.
3) Turn ignition switch OFF.
4) Disconnect connector from ABS control module.
5) Remove band.
6) Remove cable clamp cover.
7) Remove screws securing connector cover.

CAUTION:
Do not allow harness to catch on adjacent parts during installation.

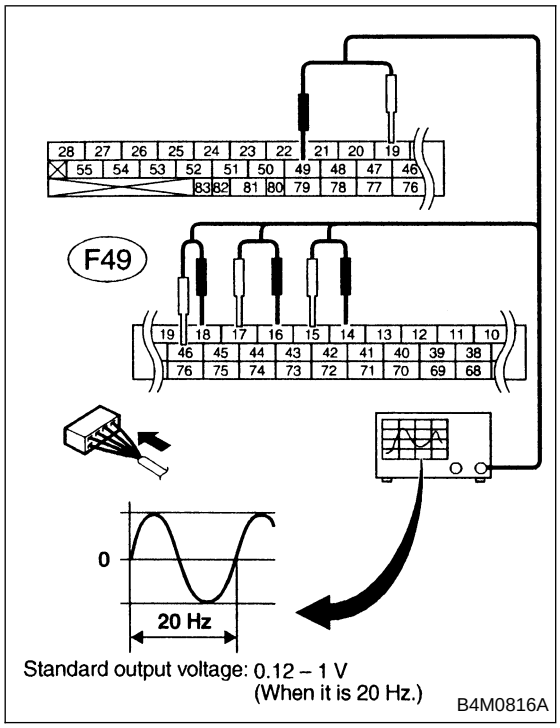


8) Remove connector cover.



NOTE:
- To install, reverse above removal procedures.
- Align connector cover rib with connector hole before installation.

9) Connect connector to ABS control module.
10) Connect the oscilloscope to the ABS control module connector in accordance with trouble code.
11) Turn ignition switch ON.



12) Rotate wheels and measure voltage at specified frequency.
NOTE:
When this inspection is completed, the ABS control module sometimes stores the trouble code 29.

TROUBLE CODE / Connector & terminal:
22 / (F49) No. 14 (+) — No. 15 (−)
24 / (F49) No. 49 (+) — No. 19 (−)
26 / (F49) No. 18 (+) — No. 46 (−)
28 / (F49) No. 16 (+) — No. 17 (−)
Specified voltage: 0.12 — 1 V (When it is 20 Hz.)

CHECK ***: Is oscilloscope pattern smooth, as shown in figure?***
YES : Go to step **8C2.**
NO : Go to next step.

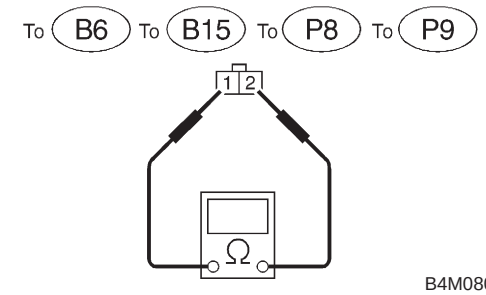
13) Remove disc rotor from hub in accordance with trouble code.

CHECK ***: Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?***
YES : Thoroughly remove dirt or other foreign matter.
NO : Go to next CHECK .
CHECK ***: Are there broken or damaged teeth in the ABS sensor pole piece or the tone wheel?***
YES : Replace ABS sensor or tone wheel.
NO : Go to next step.

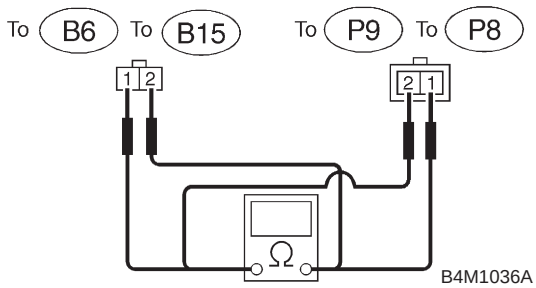
14) Measure hub runout.

CHECK ***: Is the runout less than 0.05 mm (0.0020 in)?***
YES : Go to step **8C2.**
NO : Repair hub.

Except OUTBACK with step roof model



OUTBACK with step roof model



8C2	CHECK RESISTANCE OF ABS SENSOR.

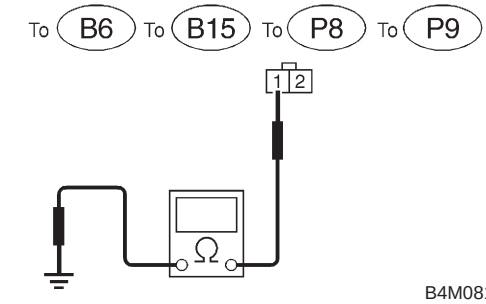
1) Turn ignition switch OFF.
2) Disconnect connector from ABS sensor.
3) Measure resistance between ABS sensor connector terminals.

CHECK : ***Trouble code/Connector & terminal***
22/to (B6) No. 1 — No. 2
24/to (B15) No. 1 — No. 2
26/to (P8) No. 1 — No. 2
28/to (P9) No. 1 — No. 2
Is resistance 0.8 — 1.2 kΩ?

YES : Go to step **8C3.**

NO : Replace ABS sensor.

Except OUTBACK with step roof model



8C3	CHECK GROUND SHORT OF ABS SENSOR.

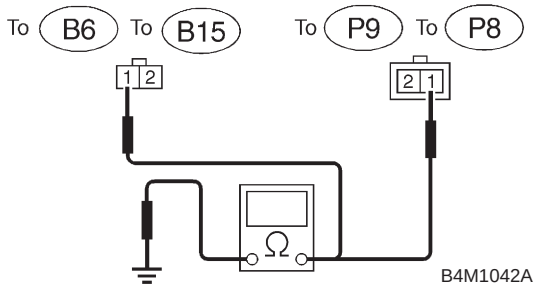
Measure resistance between ABS sensor and chassis ground.

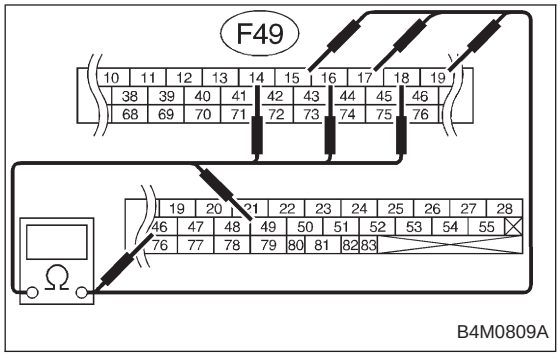
CHECK : ***Trouble code/Connector & terminal***
22/to (B6) No. 1 — Chassis ground
24/to (B15) No. 1 — Chassis ground
26/to (P8) No. 1 — Chassis ground
28/to (P9) No. 1 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8C4.**

NO : Replace ABS sensor.

OUTBACK with step roof model





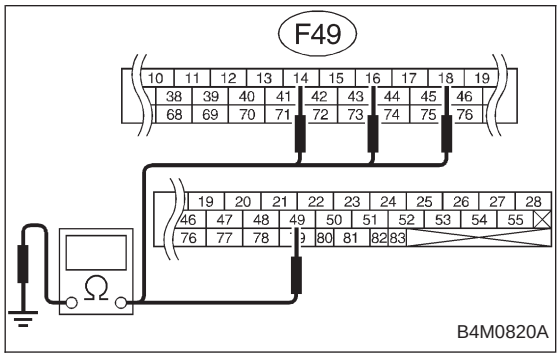
8C4	CHECK HARNESS CONNECTOR BETWEEN ABSCM AND ABS SENSOR.

1) Connect connector to ABS sensor.
2) Disconnect connector from ABS control module.
3) Measure resistance at ABSCM connector terminals.

CHECK : ***Trouble code/Connector & terminal***
22/(F49) No. 14 — No. 15
24/(F49) No. 49 — No. 19
26/(F49) No. 18 — No. 46
28/(F49) No. 16 — No. 17
Is resistance 0.8 — 1.2 kΩ?

YES : Go to step **8C5.**

NO : Repair harness connector between ABSCM and ABS sensor.



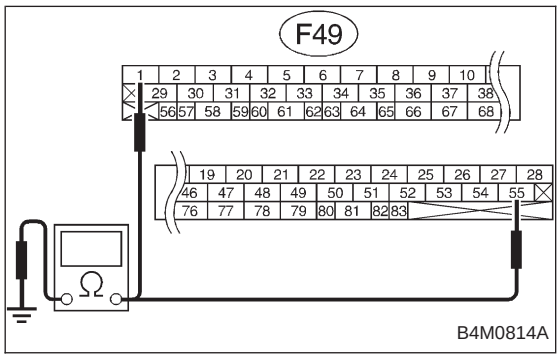
8C5	CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
22/(F49) No. 14 — Chassis ground
24/(F49) No. 49 — Chassis ground
26/(F49) No. 18 — Chassis ground
28/(F49) No. 16 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8C6.**

NO : Repair harness connector between ABSCM and ABS sensor.



8C6	CHECK GROUND CIRCUIT OF ABSCM.

Measure resistance between ABSCM and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 1 — GND
(F49) No. 55 — GND
Is resistance less than 0.5 Ω?

YES : Go to step **8C7.**

NO : Repair ABSCM ground harness.

8C7	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND ABS SENSOR.

CHECK : ***Is there poor contact in connectors between ABSCM and ABS sensor?***

YES : Repair connector.

NO : Go to step **8C8.**

8C8	CHECK SOURCES OF SIGNAL NOISE.

CHECK : ***Is the car telephone or the wireless transmitter properly installed?***

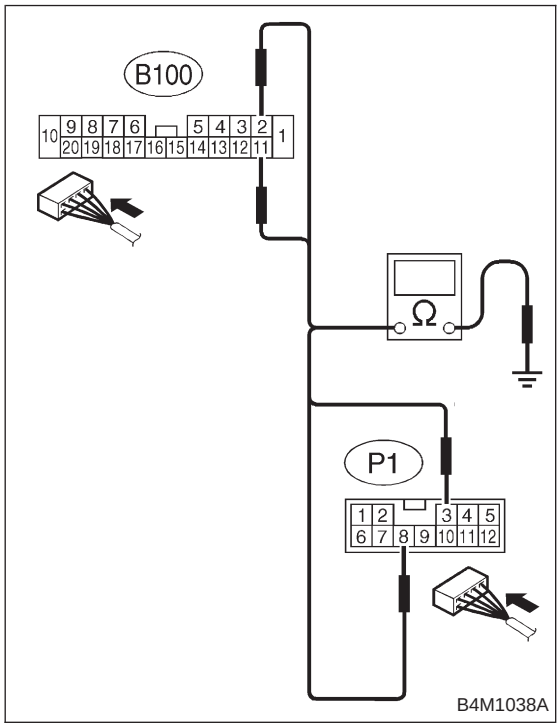
YES : Go to next CHECK .

NO : Properly install the car telephone or the wireless transmitter.

CHECK : ***Are noise sources (such as an antenna) installed near the sensor harness?***

YES : Install the noise sources apart from the sensor harness.

NO : Go to step **8C9.**



8C9	CHECK SHIELD CIRCUIT.

1) Connect all connectors.
2) Measure resistance between shield connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
22/(B100) No. 11 — Chassis ground
24/(B100) No. 2 — Chassis ground
26/(P1) No. 8 — Chassis ground
28/(P1) No. 3 — Chassis ground
Is resistance less than 0.5 Ω?

YES : Go to step **8C10.**

NO : Repair shield harness.

8C10	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary noise interference.

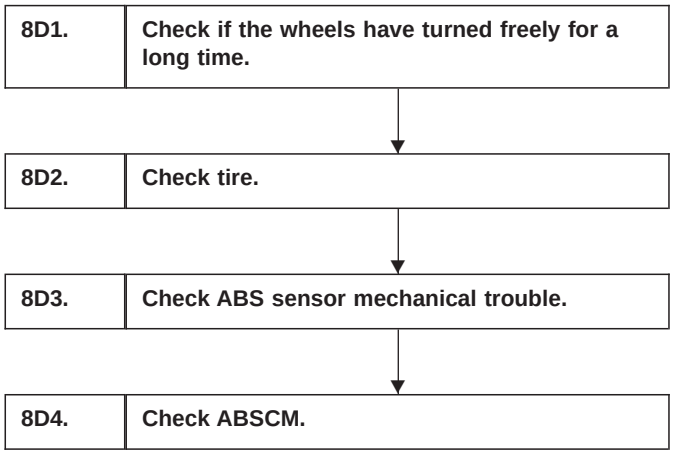
D: TROUBLE CODE 29 — ABNORMAL ABS SENSOR SIGNAL (ANY ONE OF FOUR) —

DIAGNOSIS:

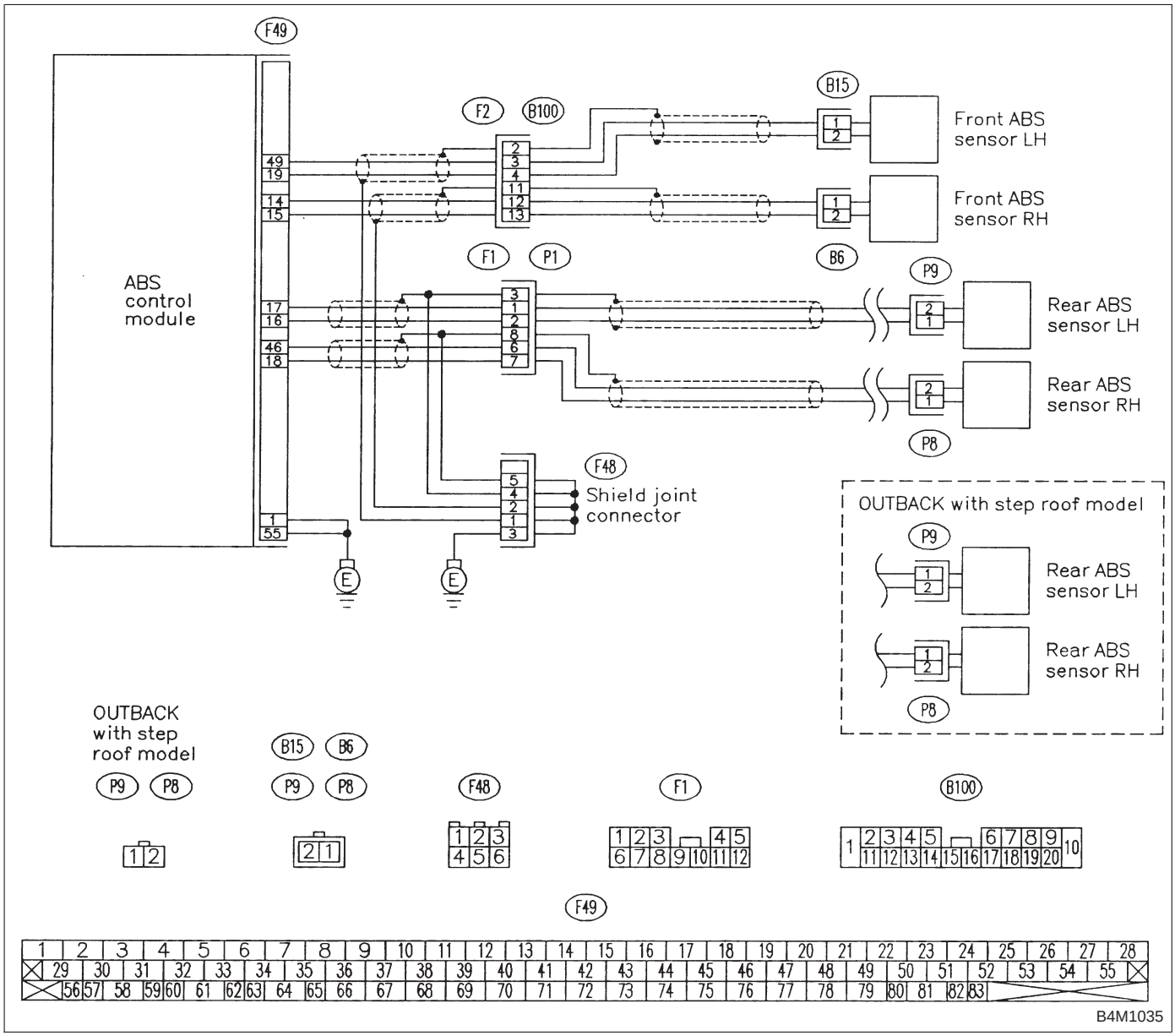
- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty tone wheel
- Wheels turning freely for a long time

TROUBLE SYMPTOM:

- ABS does not operate.



WIRING DIAGRAM:



8D1	CHECK IF THE WHEELS HAVE TURNED FREELY FOR A LONG TIME.

CHECK : ***Check if the wheels have been turned freely for more than one minute, such as when the vehicle is jacked-up, under full-lock cornering or when tire is not in contact with road surface.***

YES : The ABS is normal. Erase the trouble code.

NOTE:
When the wheels turn freely for a long time, such as when the vehicle is towed or jacked-up, or when steering wheel is continuously turned all the way, this trouble code may sometimes occur.

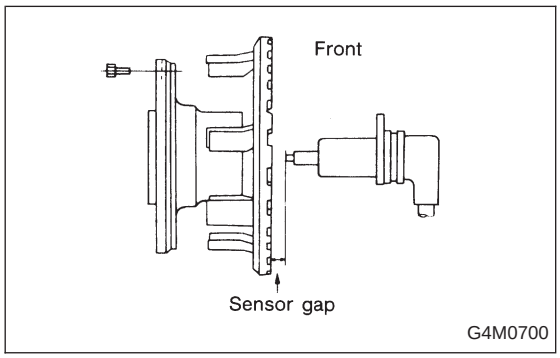
NO : Go to step **8D2.**

8D2	CHECK TIRE.

CHECK : ***Are the tire specifications correct?***
YES : Go to next CHECK .
NO : Replace tire.
CHECK : ***Is the tire worn excessively?***
YES : Replace tire.
NO : Go to next CHECK .
CHECK : ***Is the tire pressure correct?***
YES : Go to step **8D3.**
NO : Adjust tire pressure.

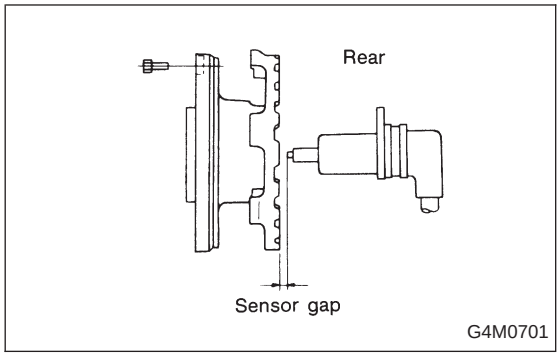
8D3	CHECK ABS SENSOR MECHANICAL TROUBLE.

CHECK : ***Tightening torque:***
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)
Are the ABS sensor installation bolts tightened securely?
YES : Go to next CHECK .
NO : Tighten ABS sensor installation bolts securely.
CHECK : ***Tightening torque:***
13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)
Are the tone wheel installation bolts tightened securely?
YES : Go to next step.
NO : Tighten tone wheel installation bolts securely.



1) Measure tone wheel to pole piece gap over entire perimeter of the wheel.
CHECK : ***Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

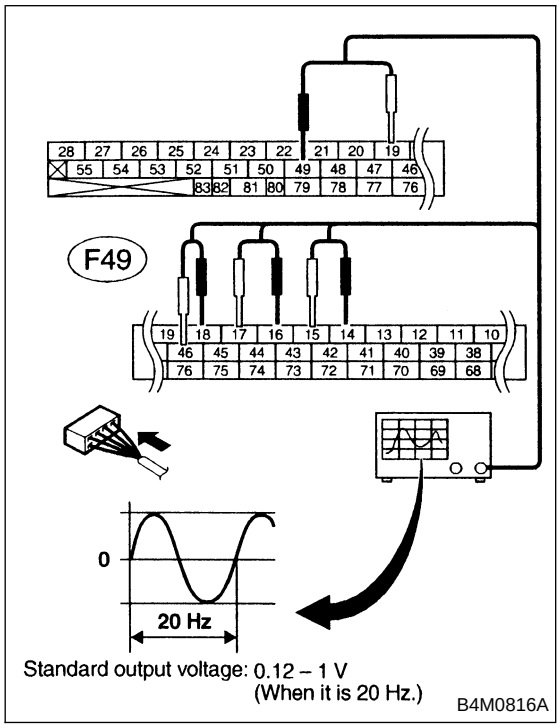


YES : Go to next CHECK .
NO : Adjust the gap.

NOTE:
Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

CHECK ***: Is an oscilloscope available?***
YES : Go to next step.
NO : Go to step 10).

2) Raise all four wheels of ground.
3) Turn ignition switch OFF.
4) Disconnect connector from ABS control module.
5) Disconnect connector cover from connector.
<Ref. to 4-4c [T8C1] steps 5) to 8).>
6) Connect connector to ABS control module.
7) Connect the oscilloscope to the ABS control module connector.
8) Turn ignition switch ON.



9) Rotate wheels and measure voltage at specified frequency.

NOTE:
When this inspection is completed, the ABS control module sometimes stores the trouble code 29.

TROUBLE CODE / Connector & terminal:
(F49) No. 14 (+) — No. 15 (−) (Front RH)
(F49) No. 49 (+) — No. 19 (−) (Front LH)
(F49) No. 18 (+) — No. 46 (−) (Rear RH)
(F49) No. 16 (+) — No. 17 (−) (Rear LH)
Specified voltage: 0.12 — 1 V (When it is 20 Hz.)

CHECK ***: Is oscilloscope pattern smooth, as shown in figure?***
YES : Go to step **8D4.**
NO : Go to next step.

10) Remove disc rotor from hub.

CHECK ***: Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?***

YES : Thoroughly remove dirt or other foreign matter.

NO : Go to next CHECK .

CHECK ***: Are there broken or damaged teeth in the ABS sensor pole piece or the tone wheel?***

YES : Replace ABS sensor or tone wheel.

NO : Go to next step.

11) Measure hub runout.

CHECK ***: Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **8D4.**

NO : Repair hub.

8D4	CHECK ABSCM.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

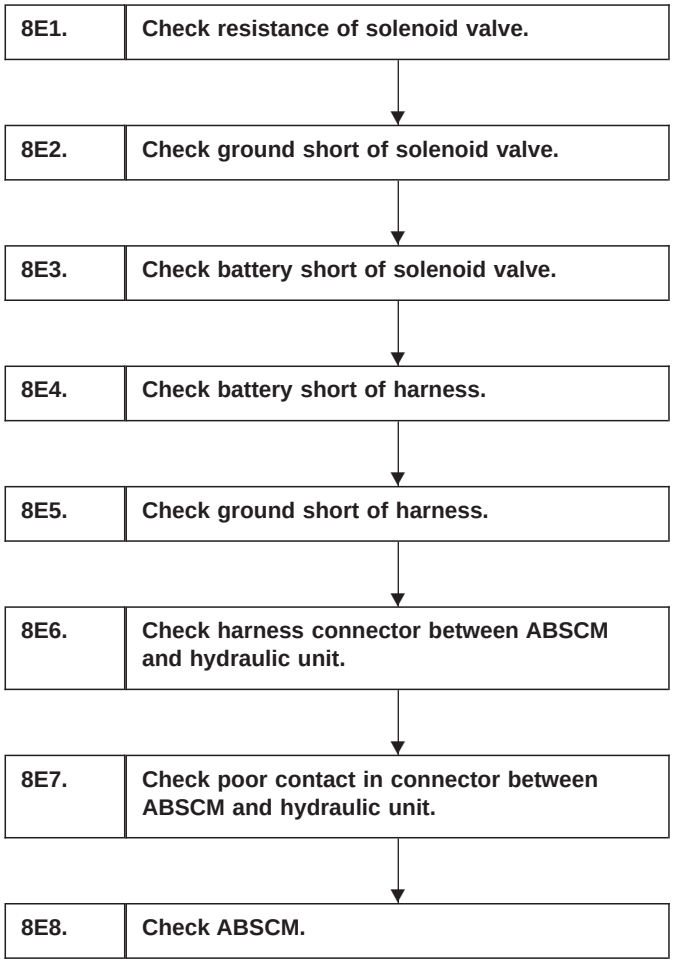
E: TROUBLE CODE 31 (FRONT RH)
TROUBLE CODE 33 (FRONT LH)
TROUBLE CODE 35 (REAR RH)
TROUBLE CODE 37 (REAR LH)
— ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN HYDRAULIC UNIT —

DIAGNOSIS:

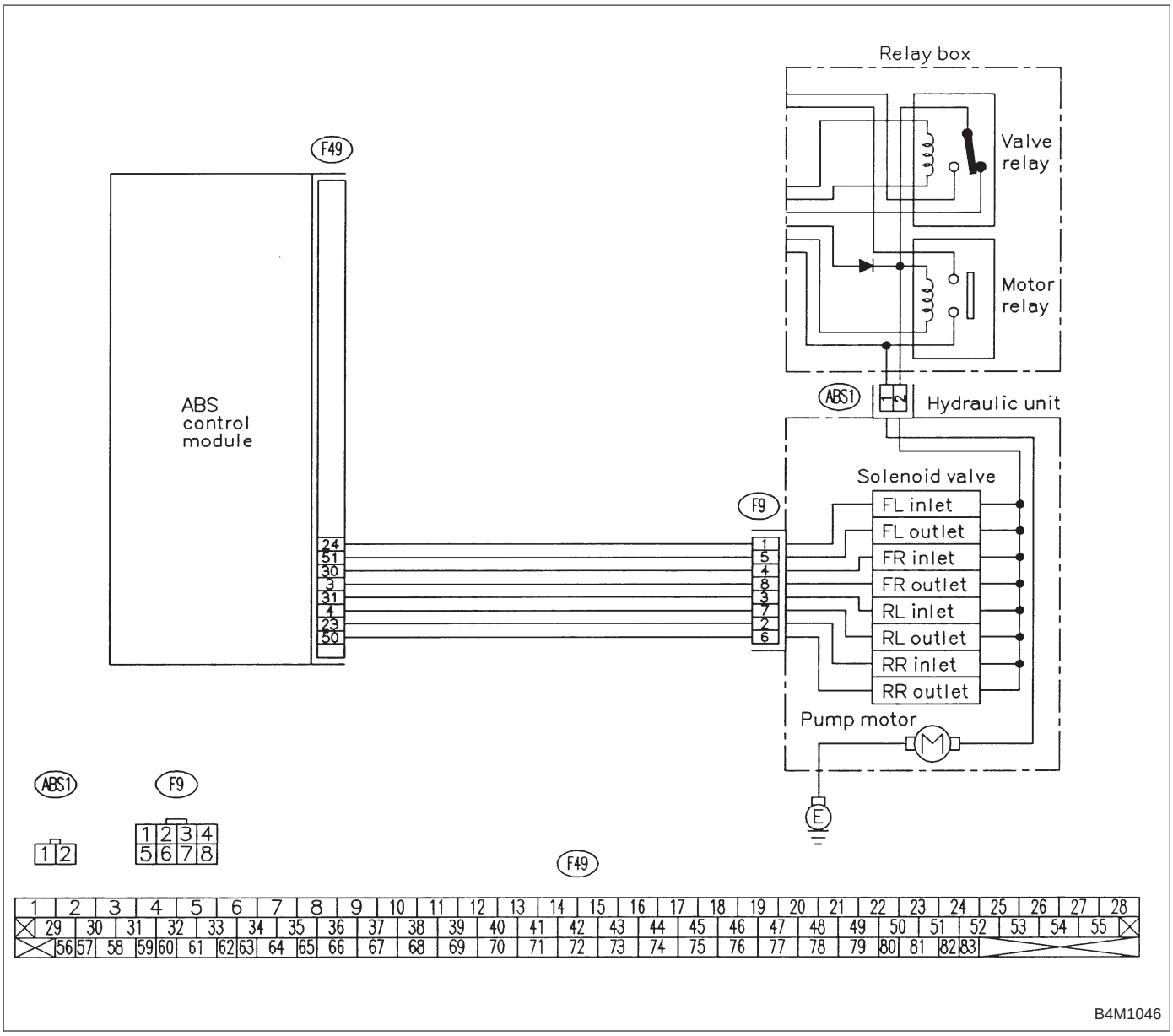
- Faulty harness/connector
- Faulty inlet solenoid valve in hydraulic unit

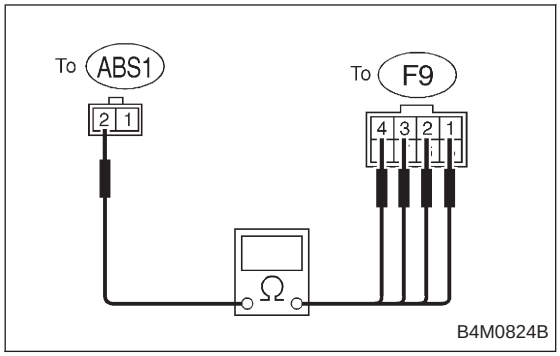
TROUBLE SYMPTOM:

- ABS does not operate.



WIRING DIAGRAM:





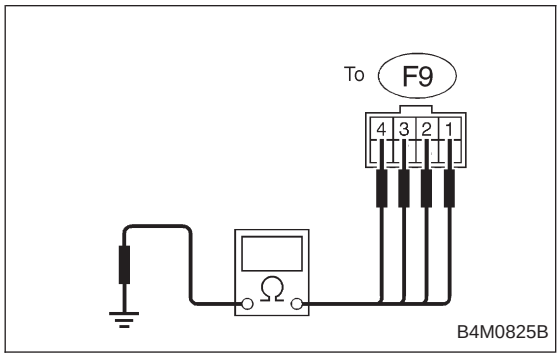
8E1	CHECK RESISTANCE OF SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
3) Measure resistance between hydraulic unit connector terminals.

CHECK : ***Trouble code/Connector & terminal***
31/to (F9) No. 4 — to (ABS1) No. 2
33/to (F9) No. 1 — to (ABS1) No. 2
35/to (F9) No. 2 — to (ABS1) No. 2
37/to (F9) No. 3 — to (ABS1) No. 2
Is resistance 8.5±0.7 Ω?

YES : Go to step **8E2.**

NO : Replace hydraulic unit.



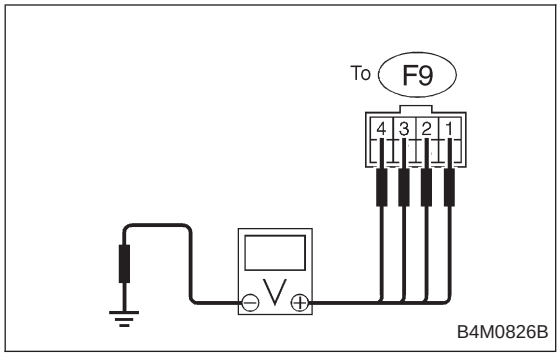
8E2	CHECK GROUND SHORT OF SOLENOID VALVE.

Measure resistance between hydraulic unit connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
31/to (F9) No. 4 — Chassis ground
33/to (F9) No. 1 — Chassis ground
35/to (F9) No. 2 — Chassis ground
37/to (F9) No. 3 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8E3.**

NO : Replace hydraulic unit.



8E3	CHECK BATTERY SHORT OF SOLENOID VALVE.

1) Disconnect connector from ABSCM.
2) Turn ignition switch to ON.
3) Measure voltage between hydraulic unit connector and chassis ground.

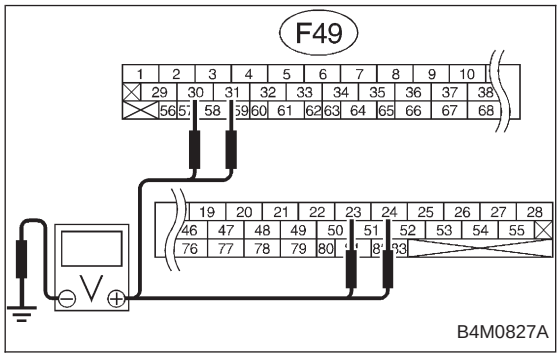
CHECK : ***Trouble code/Connector & terminal***
31/to (F9) No. 4 (+) — Chassis ground (−)
33/to (F9) No. 1 (+) — Chassis ground (−)
35/to (F9) No. 2 (+) — Chassis ground (−)
37/to (F9) No. 3 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.
NO : Replace hydraulic unit.

4) Turn ignition switch to OFF.
5) Measure voltage between hydraulic unit connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
31/to (F9) No. 4 (+) — Chassis ground (−)
33/to (F9) No. 1 (+) — Chassis ground (−)
35/to (F9) No. 2 (+) — Chassis ground (−)
37/to (F9) No. 3 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8E4.**
NO : Replace hydraulic unit.



8E4	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
31/(F49) No. 30 (+) — Chassis ground (−)
33/(F49) No. 24 (+) — Chassis ground (−)
35/(F49) No. 23 (+) — Chassis ground (−)
37/(F49) No. 31 (+) — Chassis ground (−)
Is voltage 0 V?

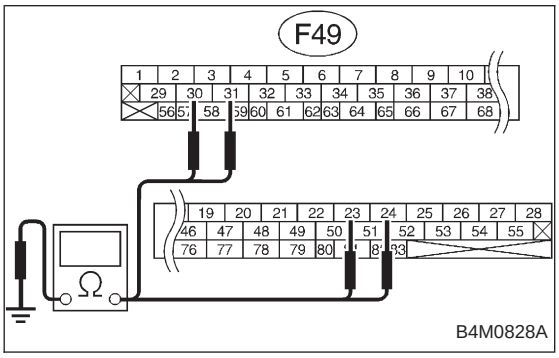
YES : Go to next step.
NO : Repair harness between ABSCM and hydraulic unit.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Trouble code/Connector & terminal***
31/(F49) No. 30 (+) — Chassis ground (−)
33/(F49) No. 24 (+) — Chassis ground (−)
35/(F49) No. 23 (+) — Chassis ground (−)
37/(F49) No. 31 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8E5.**

NO : Repair harness between ABSCM and hydraulic unit.



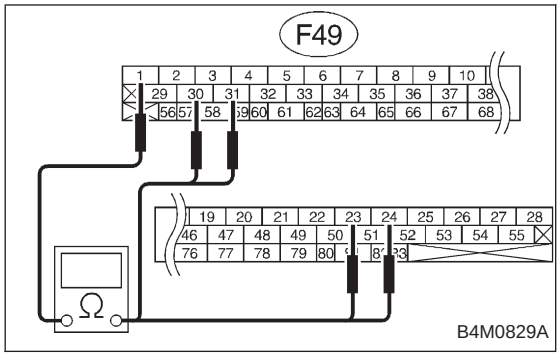
8E5	CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Trouble code/Connector & terminal***
31/(F49) No. 30 — Chassis ground
33/(F49) No. 24 — Chassis ground
35/(F49) No. 23 — Chassis ground
37/(F49) No. 31 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8E6.**

NO : Repair harness between ABSCM and hydraulic unit.



8E6	CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

1) Connect connector to hydraulic unit.
2) Measure resistance between ABSCM connector terminals.

CHECK ***: Trouble code/Connector & terminal***
31/(F49) No. 30 — No. 1
33/(F49) No. 24 — No. 1
35/(F49) No. 23 — No. 1
37/(F49) No. 31 — No. 1
Is resistance 9.0±0.7 Ω?

YES : Go to step **8E7.**

NO : Repair harness connector between ABSCM and hydraulic unit.

8E7	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

CHECK ***: Is there poor contact in connectors between ABSCM and hydraulic unit?***

YES : Repair connector.

NO : Go to step **8E8.**

8E8	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

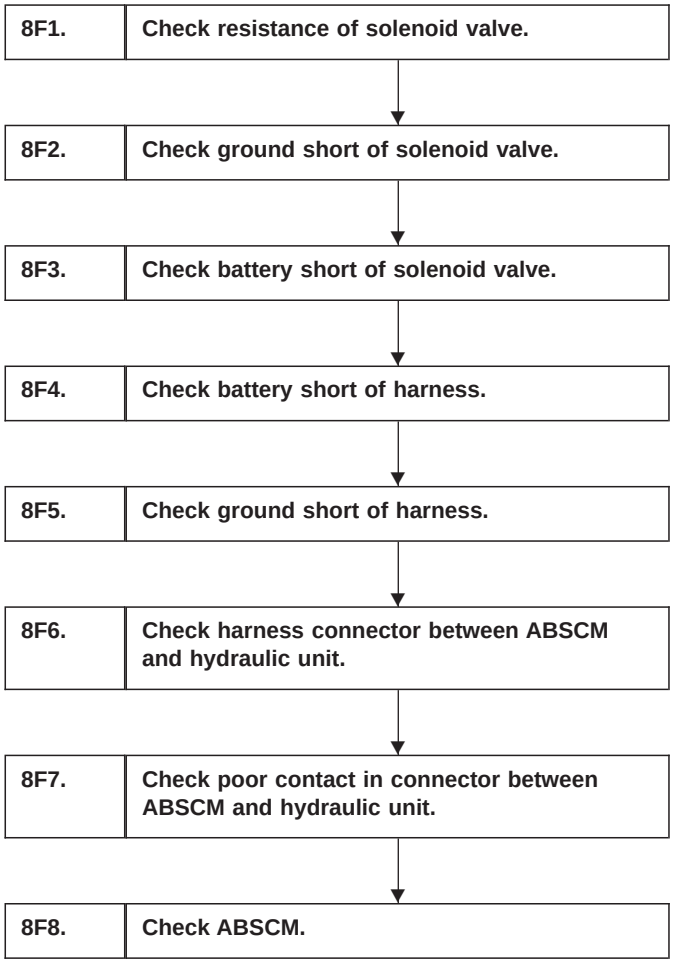
F: TROUBLE CODE 32 (FRONT RH)
TROUBLE CODE 34 (FRONT LH)
TROUBLE CODE 36 (REAR RH)
TROUBLE CODE 38 (REAR LH)
— ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN HYDRAULIC UNIT —

DIAGNOSIS:

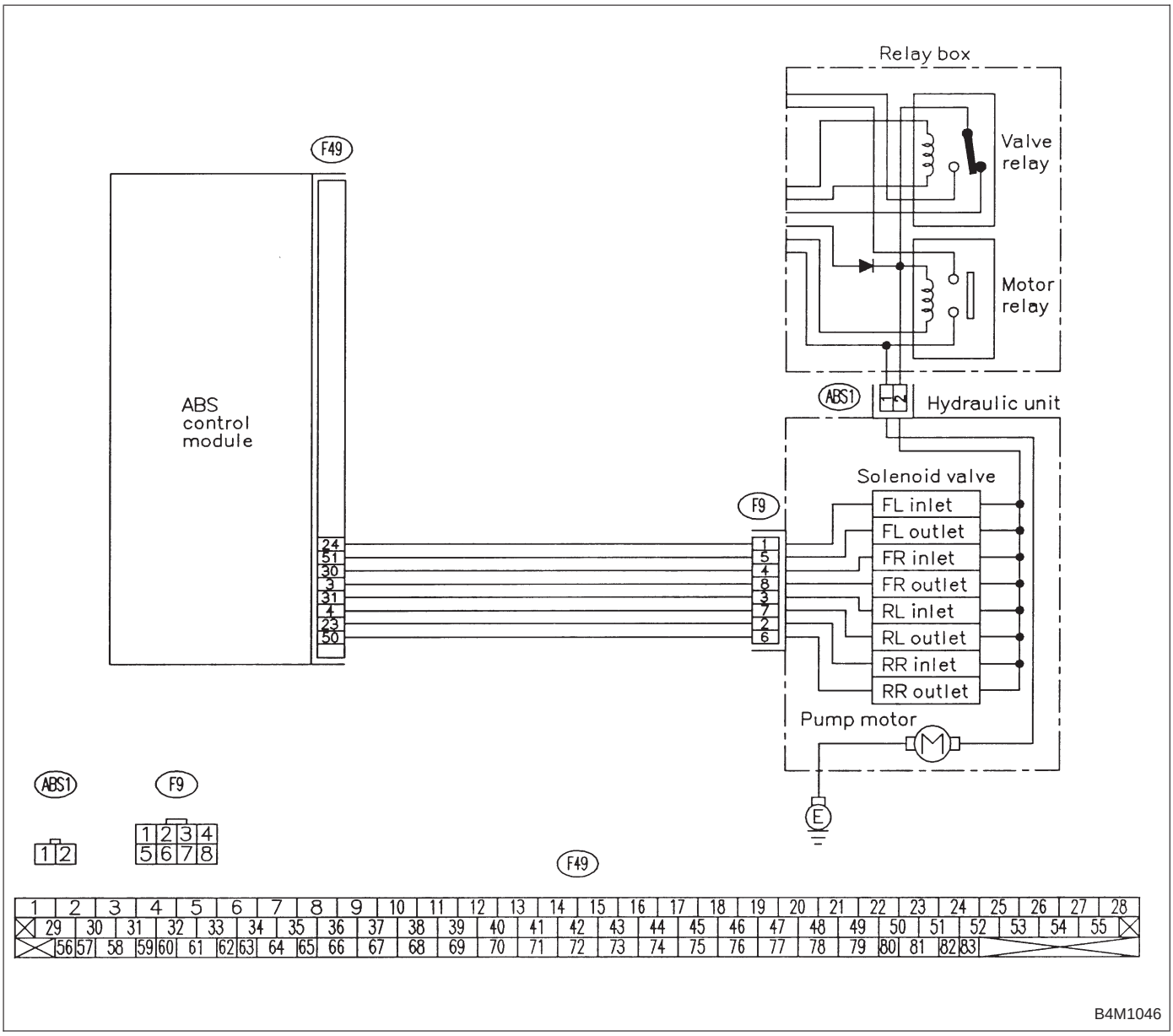
- Faulty harness/connector
- Faulty outlet solenoid valve in hydraulic unit

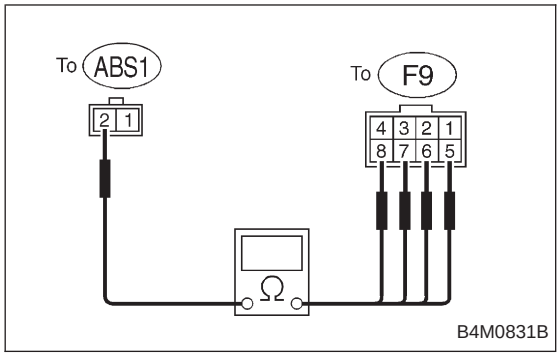
TROUBLE SYMPTOM:

- ABS does not operate.



WIRING DIAGRAM:





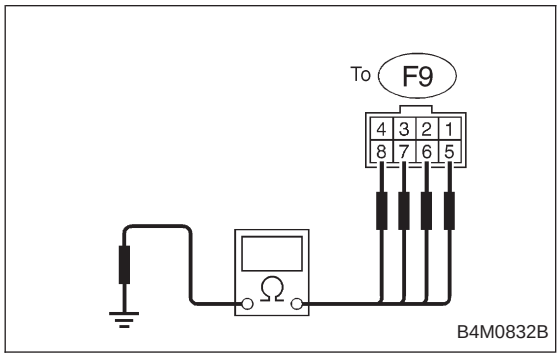
8F1	CHECK RESISTANCE OF SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
3) Measure resistance between hydraulic unit connector terminals.

CHECK : ***Trouble code/Connector & terminal***
32/to (F9) No. 8 — to (ABS1) No. 2
34/to (F9) No. 5 — to (ABS1) No. 2
36/to (F9) No. 6 — to (ABS1) No. 2
38/to (F9) No. 7 — to (ABS1) No. 2
Is resistance 4.3±0.5 Ω?

YES : Go to step **8F2.**

NO : Replace hydraulic unit.



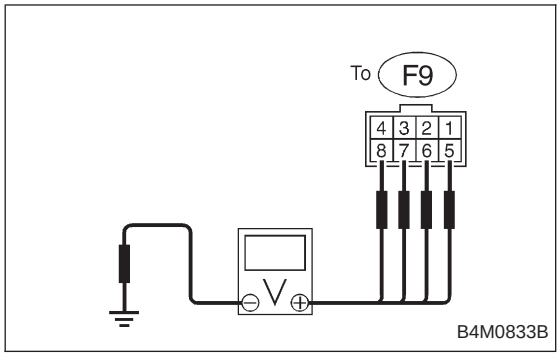
8F2	CHECK GROUND SHORT OF SOLENOID VALVE.

Measure resistance between hydraulic unit connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
32/to (F9) No. 8 — Chassis ground
34/to (F9) No. 5 — Chassis ground
36/to (F9) No. 6 — Chassis ground
38/to (F9) No. 7 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8F3.**

NO : Replace hydraulic unit.



8F3	CHECK BATTERY SHORT OF SOLENOID VALVE.

1) Disconnect connector from ABSCM.
2) Turn ignition switch to ON.
3) Measure voltage between hydraulic unit connector and chassis ground.

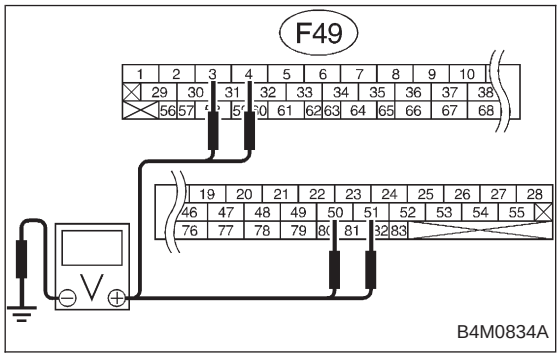
CHECK : ***Trouble code/Connector & terminal***
32/to (F9) No. 8 (+) — Chassis ground (−)
34/to (F9) No. 5 (+) — Chassis ground (−)
36/to (F9) No. 6 (+) — Chassis ground (−)
38/to (F9) No. 7 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.
NO : Replace hydraulic unit.

4) Turn ignition switch to OFF.
5) Measure voltage between hydraulic unit connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
32/to (F9) No. 8 (+) — Chassis ground (−)
34/to (F9) No. 5 (+) — Chassis ground (−)
36/to (F9) No. 6 (+) — Chassis ground (−)
38/to (F9) No. 7 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8F4.**
NO : Replace hydraulic unit.



8F4	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
32/(F49) No. 3 (+) — Chassis ground (−)
34/(F49) No. 51 (+) — Chassis ground (−)
36/(F49) No. 50 (+) — Chassis ground (−)
38/(F49) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

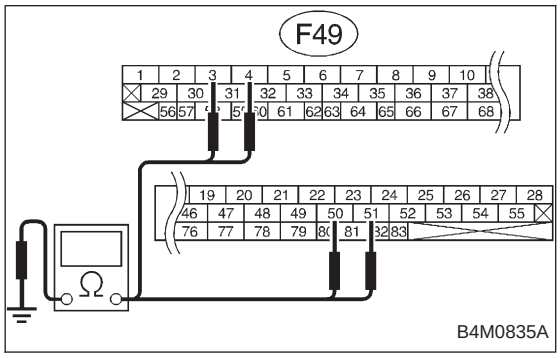
YES : Go to next step.
NO : Repair harness between ABSCM and hydraulic unit.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
32/(F49) No. 3 (+) — Chassis ground (−)
34/(F49) No. 51 (+) — Chassis ground (−)
36/(F49) No. 50 (+) — Chassis ground (−)
38/(F49) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8F5.**

NO : Repair harness between ABSCM and hydraulic unit.



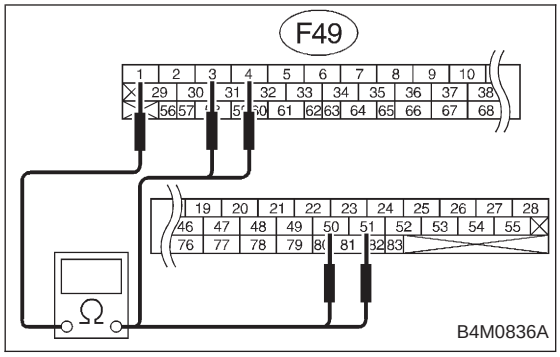
8F5	CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
32/(F49) No. 3 — Chassis ground
34/(F49) No. 51 — Chassis ground
36/(F49) No. 50 — Chassis ground
38/(F49) No. 4 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8F6.**

NO : Repair harness between ABSCM and hydraulic unit.



8F6	CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

1) Connect connector to hydraulic unit.
2) Measure resistance between ABSCM connector terminals.

CHECK ***: Trouble code/Connector & terminal***
32/(F49) No. 3 — No. 1
34/(F49) No. 51 — No. 1
36/(F49) No. 50 — No. 1
38/(F49) No. 4 — No. 1
Is resistance 4.8±0.5 Ω?

YES : Go to step **8F7.**

NO : Repair harness connector between ABSCM and hydraulic unit.

8F7	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

CHECK ***: Is there poor contact in connectors between ABSCM and hydraulic unit?***

YES : Repair connector.

NO : Go to step **8F8.**

8F8	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

G: TROUBLE CODE 41
— ABNORMAL ABS CONTROL MODULE —

DIAGNOSIS:

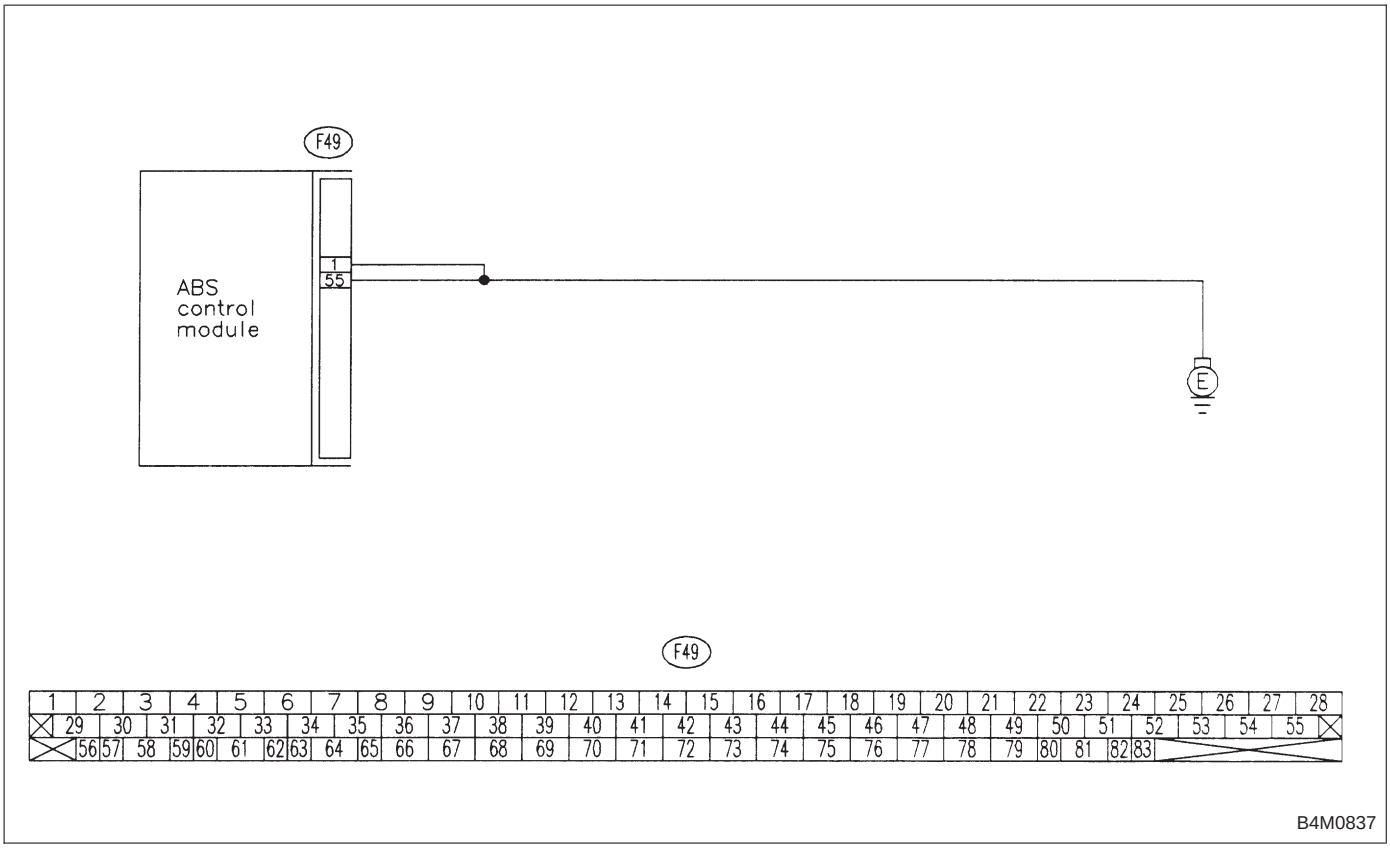
- Faulty ABSCM

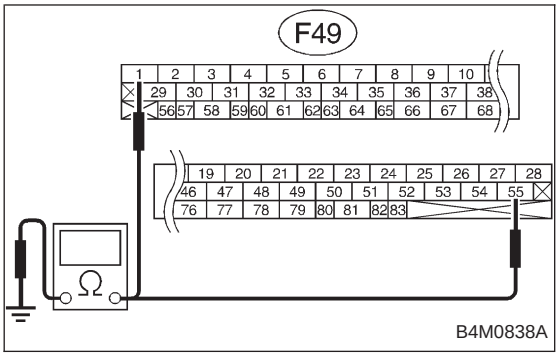
TROUBLE SYMPTOM:

- ABS does not operate.

8G1.	**Check ground circuit of ABSCM.**
↓	
8G2.	**Check poor contact in connector between battery, ignition switch and ABSCM.**
↓	
8G3.	**Check sources of signal noise.**
↓	
8G4.	**Check ABSCM.**

WIRING DIAGRAM:





8G1	CHECK GROUND CIRCUIT OF ABSCM.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM.
3) Measure resistance between ABSCM and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 1 — Chassis ground
(F49) No. 55 — Chassis ground
Is resistance less than 0.5 Ω?

YES : Go to step **8G2.**

NO : Repair ABSCM ground harness.

8G2	CHECK POOR CONTACT IN CONNECTORS BETWEEN BATTERY, IGNITION SWITCH AND ABSCM.

CHECK : ***Is there poor contact in connectors between battery, ignition switch and ABSCM?***

YES : Repair connector.

NO : Go to step **8G3.**

8G3	CHECK SOURCES OF SIGNAL NOISE.

CHECK : ***Is the car telephone or the wireless transmitter properly installed?***

YES : Go to next CHECK .

NO : Properly install the car telephone or the wireless transmitter.

CHECK : ***Are noise sources (such as an antenna) installed near the sensor harness?***

YES : Install the noise sources apart from the sensor harness.

NO : Go to step **8G4.**

8G4	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

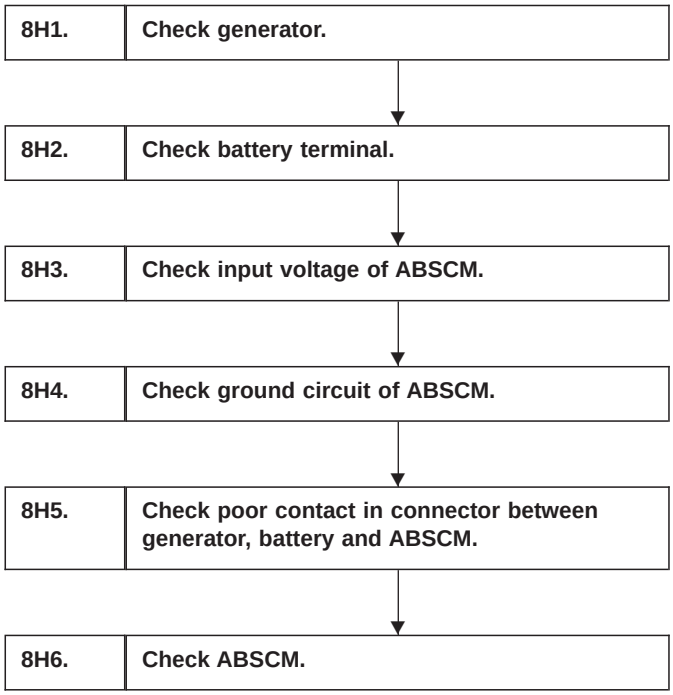
H: TROUBLE CODE 42 — SOURCE VOLTAGE IS LOW. —

DIAGNOSIS:

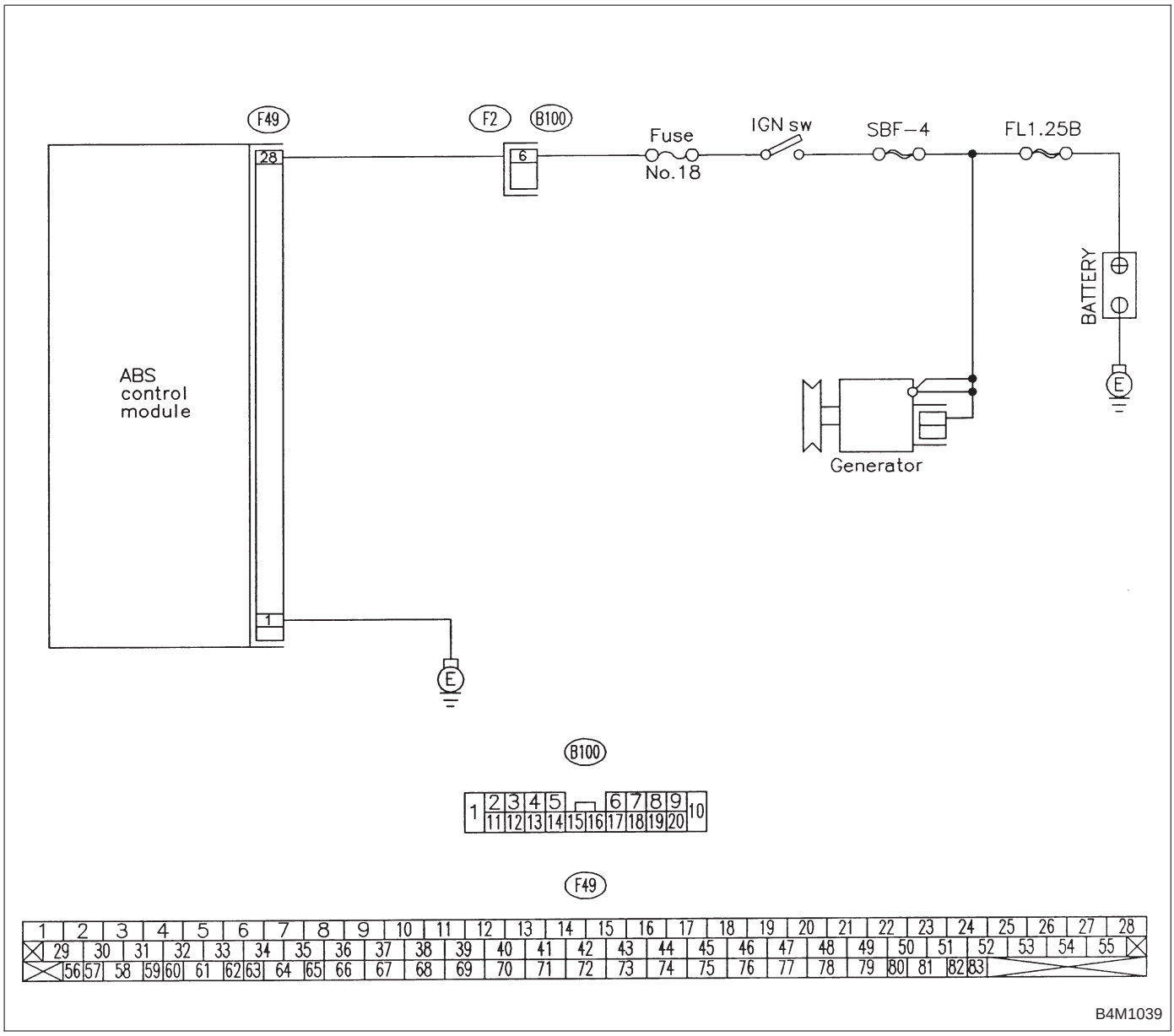
- Power source voltage of the ABSCM is low.

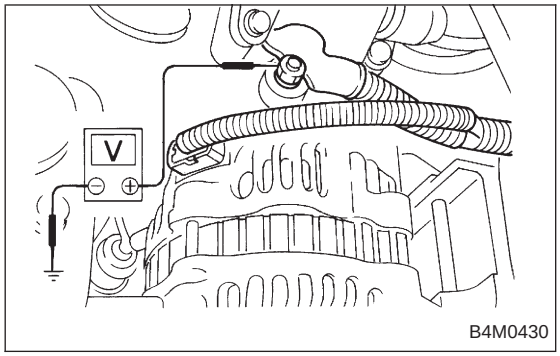
TROUBLE SYMPTOM:

- ABS does not operate.



WIRING DIAGRAM:





8H1	CHECK GENERATOR.

1) Start engine.
2) Idling after warm-up.
3) Measure voltage between generator B terminal and chassis ground.

CHECK : ***Terminal***
Generator B terminal — Chassis ground
Is voltage 10 — 15 V?

YES : Go to step **8H2.**

NO : Repair generator.

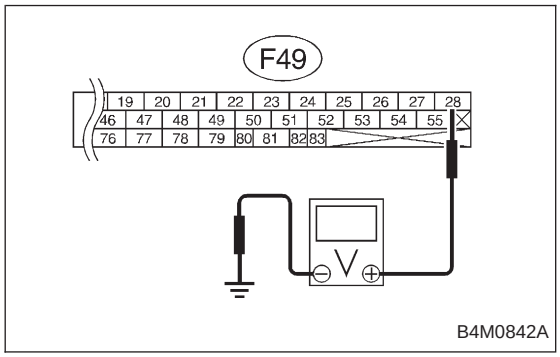
8H2	CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

CHECK : ***Are the positive and negative battery terminals tightly clamped?***

YES : Go to step **8H3.**

NO : Tighten the clamp of terminal.



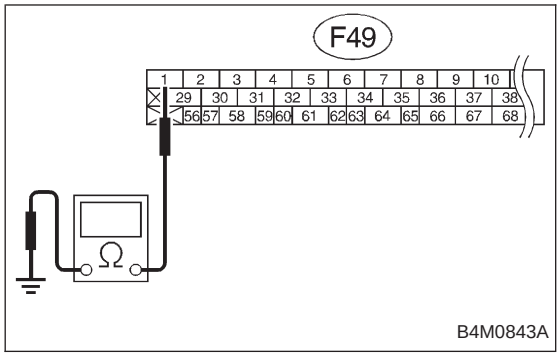
8H3	CHECK INPUT VOLTAGE OF ABSCM.

1) Disconnect connector from ABSCM.
2) Run the engine at idle.
3) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 28 (+) — Chassis ground (−)
Is voltage 10 — 15 V?

YES : Go to step **8H4.**

NO : Repair harness connector between battery, ignition switch and ABSCM.



8H4	CHECK GROUND CIRCUIT OF ABSCM.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal (F49) No. 1 — Chassis ground Is resistance less than 0.5 Ω?***

YES : Go to step **8H5.**

NO : Repair ABSCM ground harness.

8H5	CHECK POOR CONTACT IN CONNECTOR BETWEEN GENERATOR, BATTERY AND ABSCM.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM?***

YES : Repair connector.

NO : Go to step **8H6.**

8H6	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

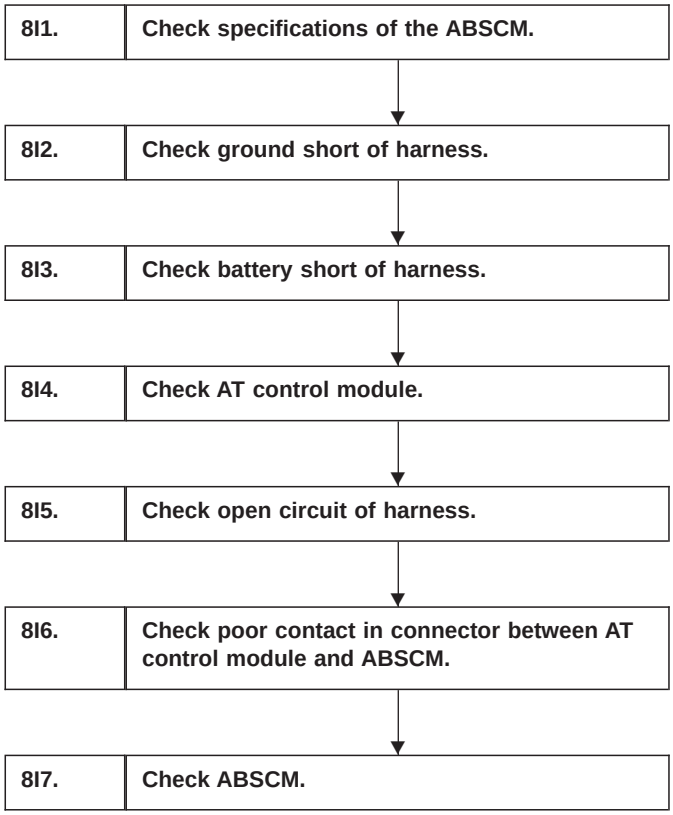
I: TROUBLE CODE 44 — A COMBINATION OF AT CONTROL ABNORMALS —

DIAGNOSIS:

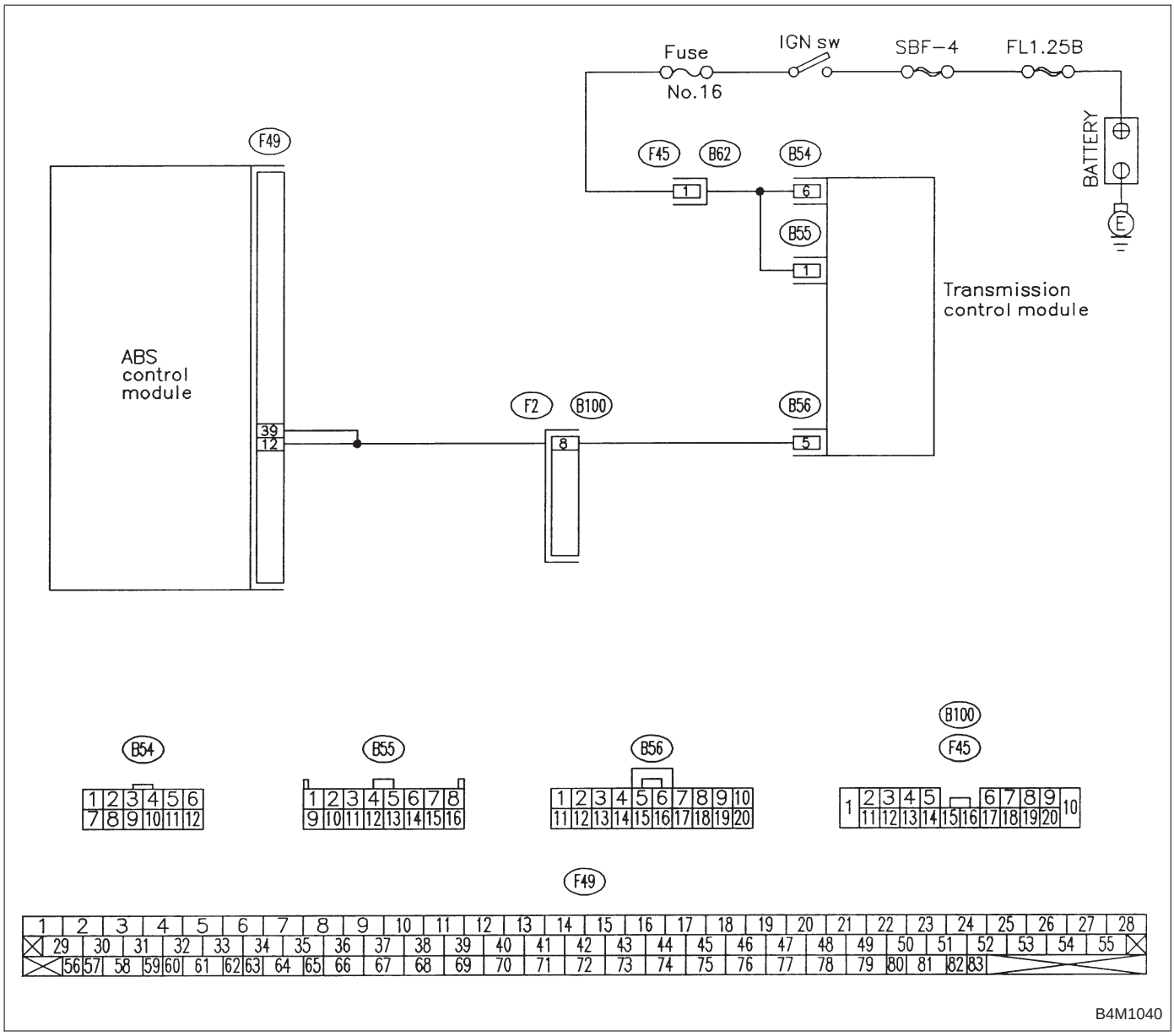
- Combination of AT control faults

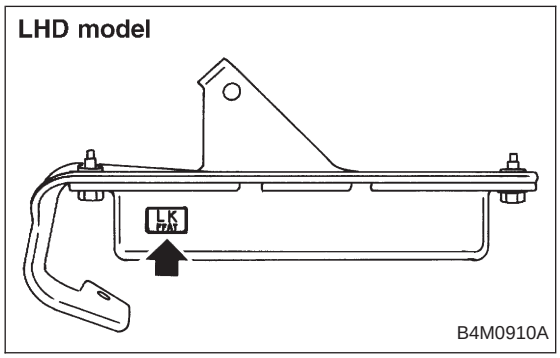
TROUBLE SYMPTOM:

- ABS does not operate.



WIRING DIAGRAM:





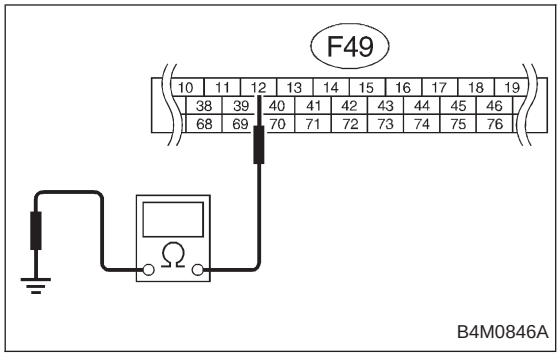
8I1	CHECK SPECIFICATIONS OF THE ABSCM.

Check specifications of the plate attached to the ABSCM.

CHECK ***: Is an ABSCM for AT model installed on a MT model?***

YES : Replace ABSCM.

NO : Go to step **8I2.**



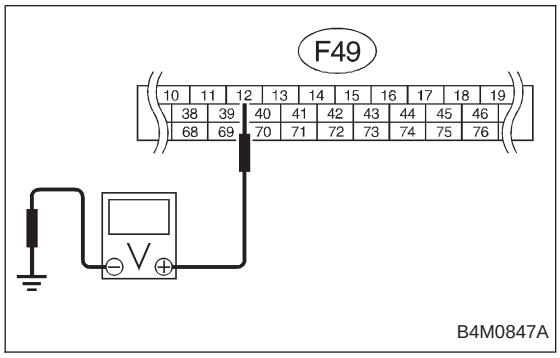
8I2	CHECK GROUND SHORT OF HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect two connectors from AT control module.
3) Disconnect connector from ABSCM.
4) Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 12 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8I3.**

NO : Repair harness between AT control module and ABSCM.



8I3	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 12 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

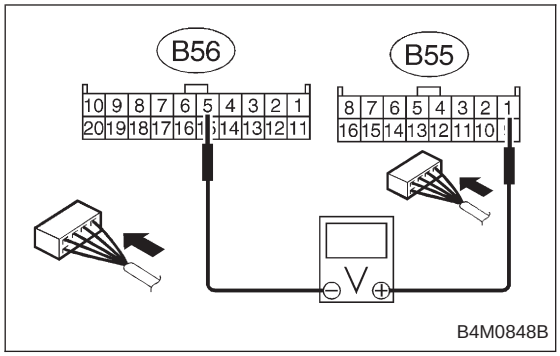
NO : Repair harness between AT control module and ABSCM.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 12 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8I4.**

NO : Repair harness between AT control module and ABSCM.



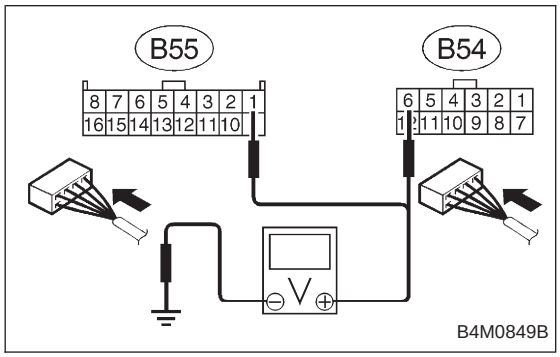
8I4	CHECK AT CONTROL MODULE.

1) Connect all connectors to AT control module.
2) Turn ignition switch to ON.
3) Measure voltage between AT control module connector terminals.

CHECK : ***Connector & terminal***
(B55) No. 1 (+) — (B56) No. 5 (−)
Is voltage 10 — 13 V?

YES : Go to step **8I5.**

NO : Go to next step.

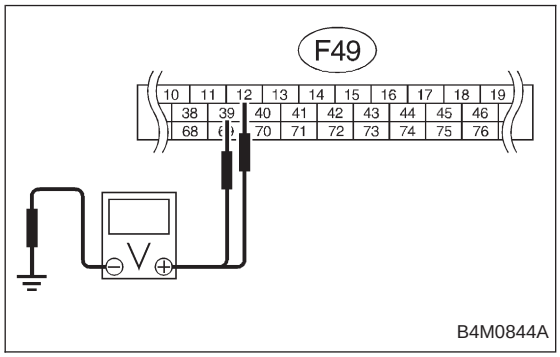


4) Measure voltage between AT control module connector and chassis ground.

CHECK : ***Connector & terminal***
(B54) No. 6 (+) — Chassis ground (−)
(B55) No. 1 (+) — Chassis ground (−)
Is voltage 10 — 13 V?

YES : Replace AT control module.

NO : Repair harness connector between battery, ignition switch and AT control module.



8I5	CHECK OPEN CIRCUIT OF HARNESS.

Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 12 (+) — Chassis ground (−)
(F49) No. 39 (+) — Chassis ground (−)
Is voltage 10 — 13 V?

YES : Go to step **8I6.**

NO : Repair harness connector between AT control module and ABSCM.

8I6	**CHECK POOR CONTACT IN CONNECTOR BETWEEN AT CONTROL MODULE AND ABSCM.**

CHECK ***: Is there poor contact in connectors between AT control module and ABSCM?***

YES : Repair connector.

NO : Go to step **8I7.**

8I7	**CHECK ABSCM.**

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

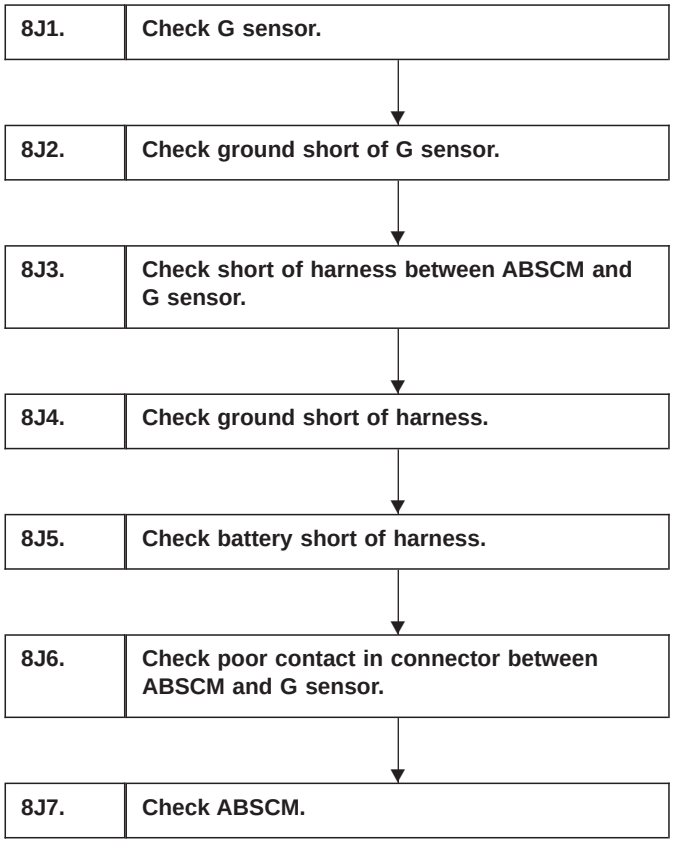
J: TROUBLE CODE 46 — ABNORMAL G SENSOR POWER SUPPLY VOLTAGE —

DIAGNOSIS:

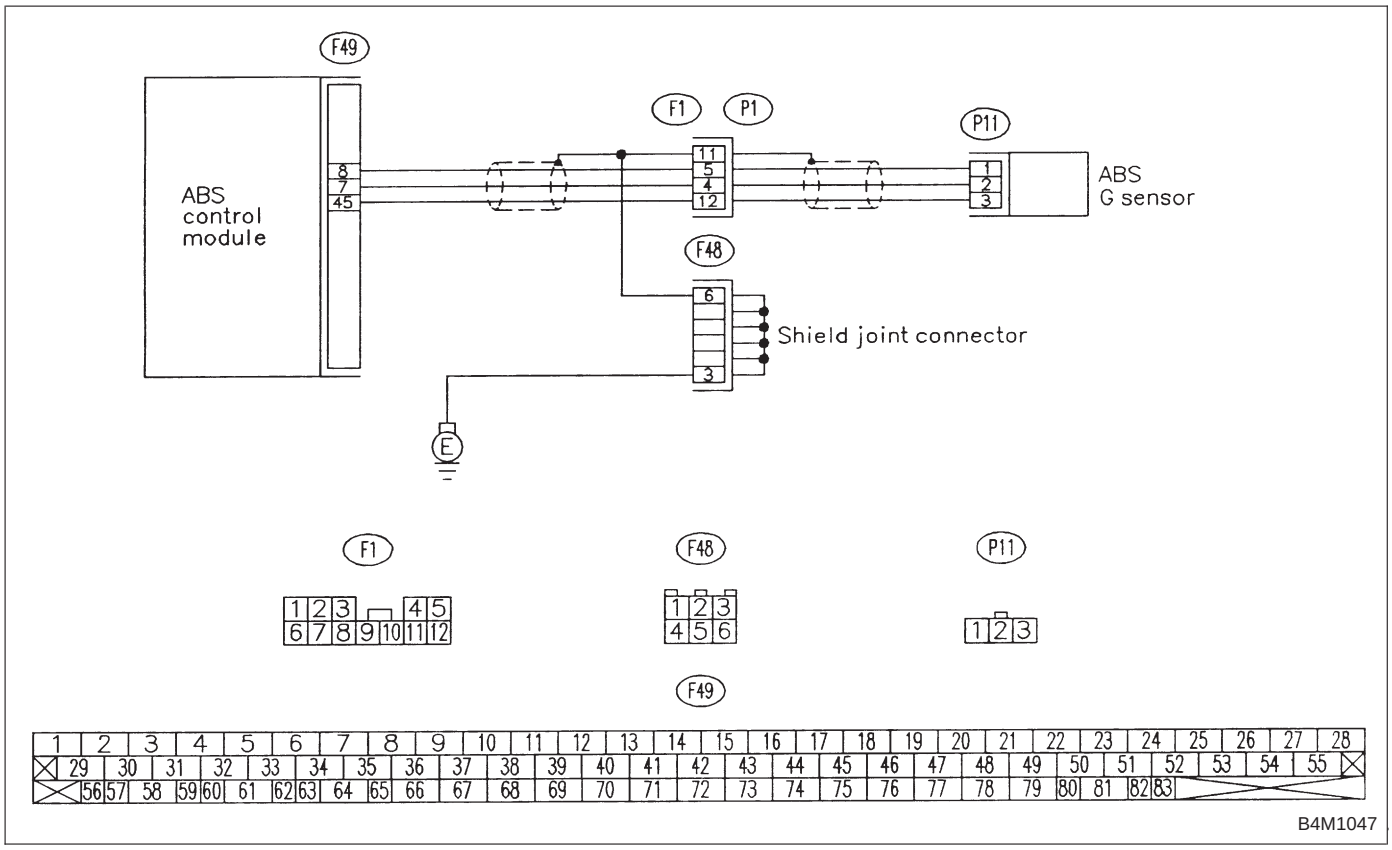
- Faulty G sensor power supply voltage

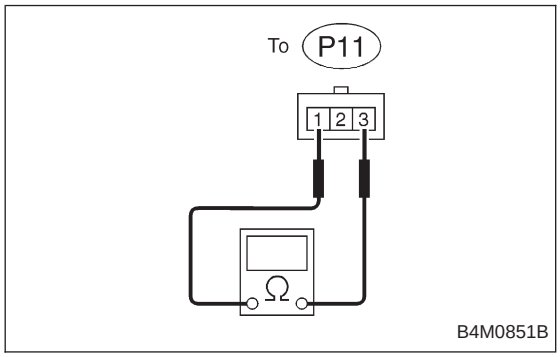
TROUBLE SYMPTOM:

- ABS does not operate.



WIRING DIAGRAM:





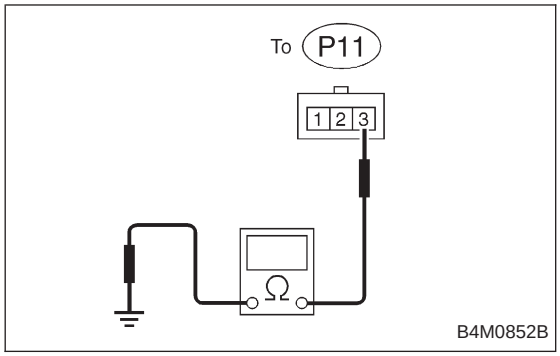
8J1	CHECK G SENSOR.

1) Turn ignition switch to OFF.
2) Remove console box.
3) Disconnect connector from G sensor.
4) Measure resistance of G sensor.

CHECK ***: Connector & terminal To (P11) No. 1 — No. 3 Is resistance 50±8 kΩ?***

YES : Go to step **8J2.**

NO : Replace G sensor.



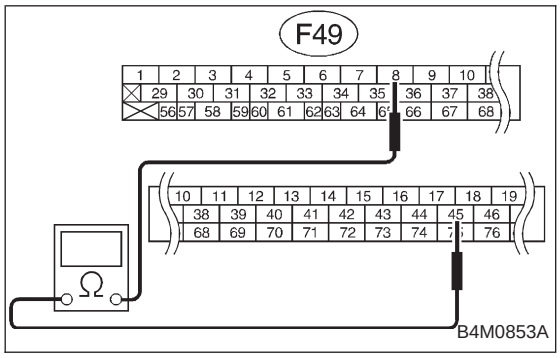
8J2	CHECK GROUND SHORT OF G SENSOR.

Measure resistance between G sensor and bracket.

CHECK : ***Connector & terminal***
To (P11) No. 3 — Bracket
Is resistance more than 1 MΩ?

YES : Go to step **8J3.**

NO : Replace G sensor.



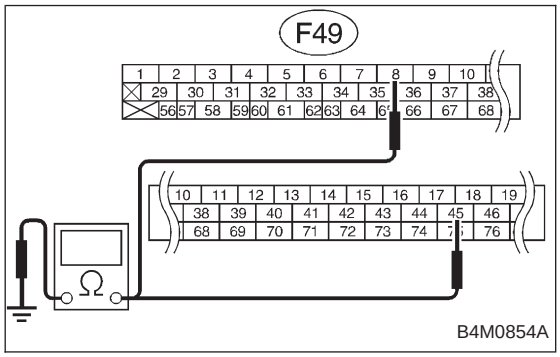
8J3	CHECK SHORT OF HARNESS BETWEEN ABSCM AND G SENSOR.

1) Disconnect connector from ABSCM.
2) Measure resistance between ABSCM connector terminals.

CHECK : ***Connector & terminal***
(F49) No. 45 — No. 8
Is resistance more than 1 MΩ?

YES : Go to step **8J4.**

NO : Repair harness between ABSCM and G sensor.



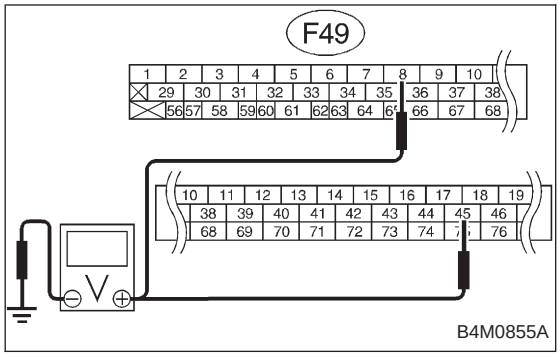
8J4	CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 8 — Chassis ground
(F49) No. 45 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8J5.**

NO : Repair harness between ABSCM and G sensor.



8J5	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 8 (+) — Chassis ground (−)
(F49) No. 45 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

NO : Repair harness between ABSCM and G sensor.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 8 (+) — Chassis ground (−)
(F49) No. 45 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8J6.**

NO : Repair harness between ABSCM and chassis ground.

8J6	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.

CHECK : ***Is there poor contact in connectors between ABSCM and G sensor?***

YES : Repair connector.

NO : Go to step **8J7.**

8J7	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

K: TROUBLE CODE 51 — ABNORMAL VALVE RELAY —

DIAGNOSIS:

- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

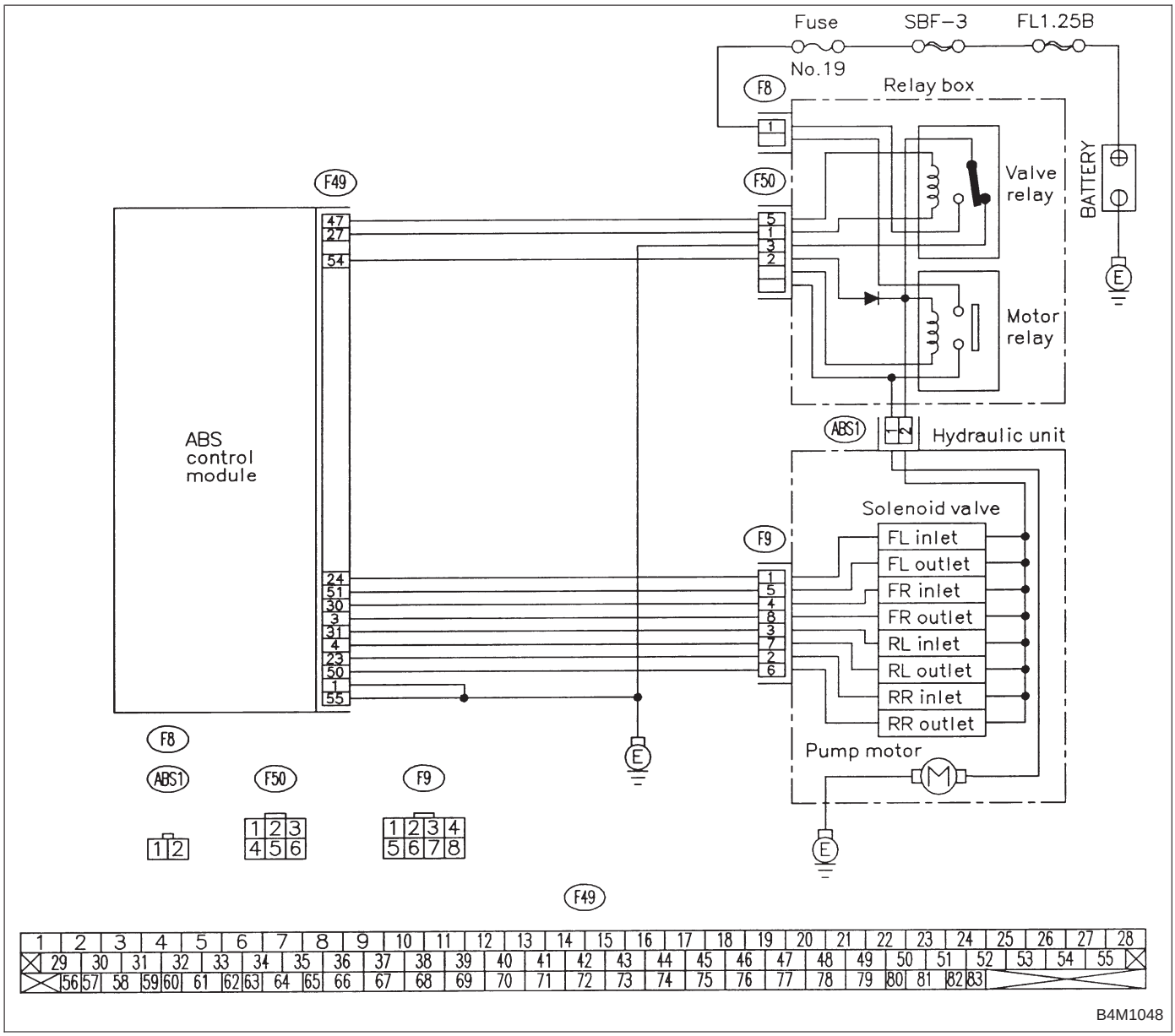
8K1.	Check resistance of valve relay.
8K2.	Check contact point of valve relay.
8K3.	Check short of valve relay.
8K4.	Check power supply voltage at valve relay contact point.
8K5.	Check ground circuit of relay box.
8K6.	Check broken wire and ground short in power supply circuit of relay box.
8K7.	Check broken wire in contact point circuit of relay box.
8K8.	Check ground short in contact point circuit of relay box.
8K9.	Check battery short in contact point circuit of relay box.
8K10.	Check diode of relay box.
8K11.	Check broken wire in ground circuit of relay box.
8K12.	Check battery short in ground circuit of relay box.
8K13.	Check broken wire in control circuit of relay box.
8K14.	Check ground short in control circuit of relay box.
8K15.	Check battery short in control circuit of relay box.

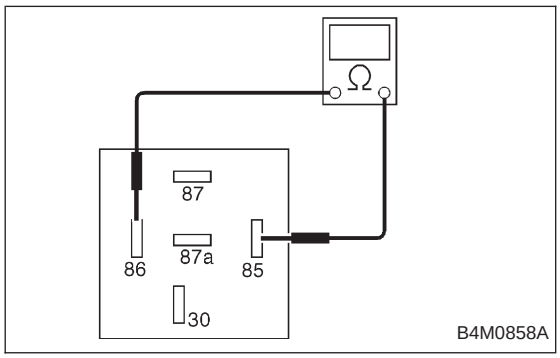
Continues to next page.

From the former page.

8K16.	Check broken wire in control system harness of valve relay.
8K17.	Check ground short in control system harness of valve relay.
8K18.	Check battery short in control system harness of valve relay.
8K19.	Check resistance of inlet solenoid valve.
8K20.	Check resistance of outlet solenoid valve.
8K21.	Check ground short of solenoid valve.
8K22.	Check battery short of solenoid valve.
8K23.	Check battery short of harness.
8K24.	Check ground short of harness.
8K25.	Check harness connector between ABSCM and hydraulic unit.
8K26.	Check poor contact in connector between ABSCM and hydraulic unit.
8K27.	Check ABSCM.

WIRING DIAGRAM:





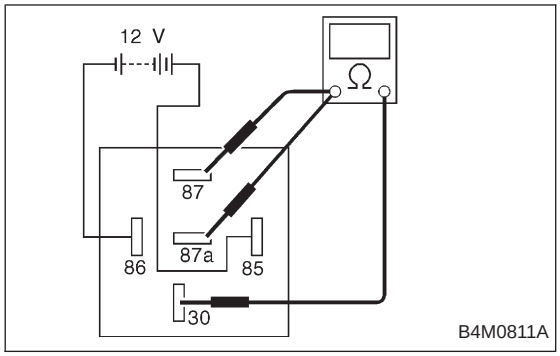
8K1	CHECK RESISTANCE OF VALVE RELAY.

1) Turn ignition switch to OFF.
2) Remove valve relay from relay box.
3) Measure resistance between valve relay terminals.

CHECK : ***Terminals***
No. 85 — No. 86
Is resistance 103±10 Ω?

YES : Go to step **8K2.**

NO : Replace valve relay.



8K2	CHECK CONTACT POINT OF VALVE RELAY.

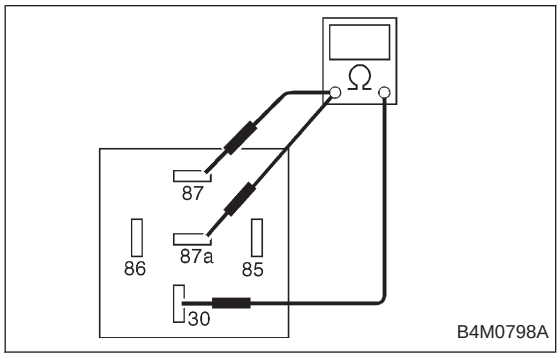
1) Connect battery to valve relay terminals No. 85 and No. 86.
2) Measure resistance between valve relay terminals.

CHECK ***: Terminals***
No. 30 — No. 87
Is resistance less than 0.5 Ω?

YES : Go to next CHECK .
NO : Replace valve relay.

CHECK ***: Terminals***
No. 30 — No. 87a
Is resistance more than 1 MΩ?

YES : Go to next step.
NO : Replace valve relay.



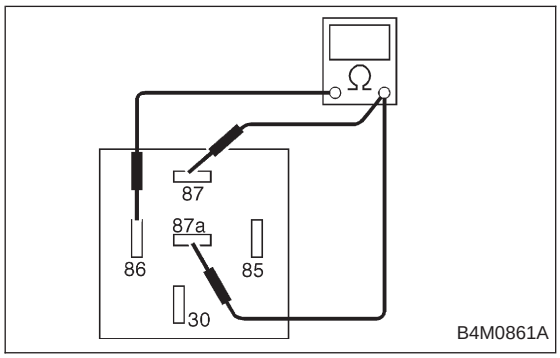
3) Disconnect battery from valve relay terminals.
4) Measure resistance between valve relay terminals.

CHECK ***: Terminals***
No. 30 — No. 87
Is resistance more than 1 MΩ?

YES : Go to next CHECK .
NO : Replace valve relay.

CHECK ***: Terminals***
No. 30 — No. 87a
Is resistance less than 0.5 Ω?

YES : Go to step **8K3.**
NO : Replace valve relay.

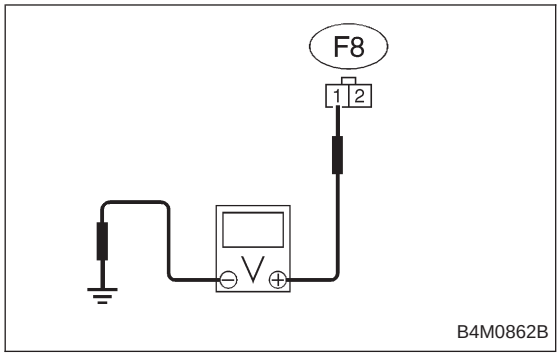


8K3	CHECK SHORT OF VALVE RELAY.

Measure resistance between valve relay terminals.

CHECK ***: Terminals***
No. 86 — No. 87
No. 86 — No. 87a
Is resistance more than 1 MΩ?

YES : Go to step **8K4.**
NO : Replace valve relay.



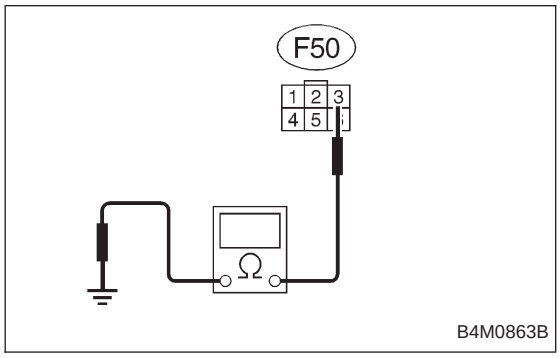
8K4	CHECK POWER SUPPLY VOLTAGE AT VALVE RELAY CONTACT POINT.

1) Disconnect connector (F8) from relay box.
2) Measure voltage between relay box connector and chassis ground.

CHECK ***: Connector & terminal***
(F8) No. 1 (+) — Chassis ground (−)
Is voltage 10 — 13 V?

YES : Go to step **8K5.**

NO : Repair harness connector between battery and relay box. Check fuse No. 19.



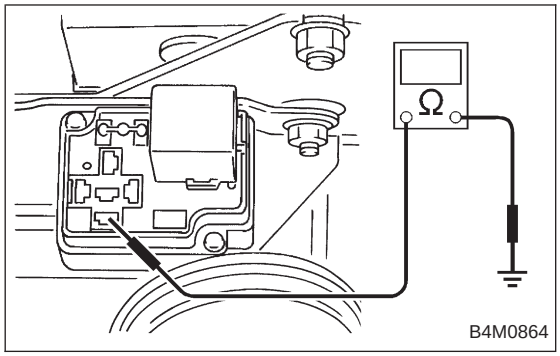
8K5	CHECK GROUND CIRCUIT OF RELAY BOX.

1) Disconnect connector (F50) from relay box.
2) Measure resistance between relay box connector and chassis ground.

CHECK ***: Connector & terminal***
(F50) No. 3 — Chassis ground
Is resistance less than 0.5 Ω?

YES : Go to step **8K6.**

NO : Repair relay box ground harness.



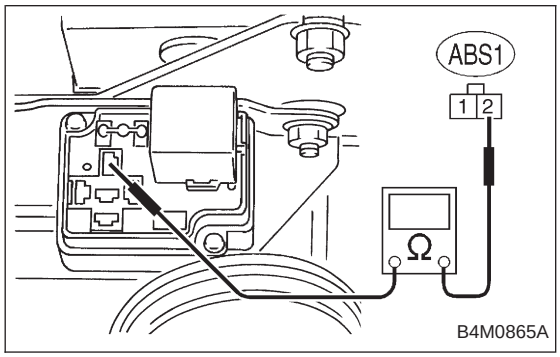
8K6	CHECK BROKEN WIRE AND GROUND SHORT IN POWER SUPPLY CIRCUIT OF RELAY BOX.

1) Disconnect connector (ABS1) from hydraulic unit.
2) Connect connector (F8) to relay box.
3) Measure voltage of relay box.

CHECK ***: Connector & terminal***
Valve relay installing point No. 87 — Chassis ground
Is voltage 10 — 13 V?

YES : Go to step **8K7.**

NO : Replace relay box. Check fuse No. 19.



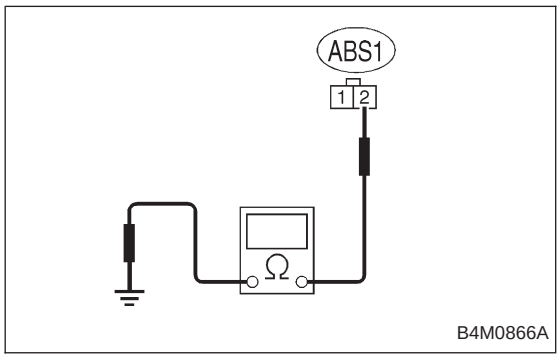
8K7	CHECK BROKEN WIRE IN CONTACT POINT CIRCUIT OF RELAY BOX.

Measure resistance between hydraulic unit connector and valve relay installing point.

CHECK ***: Connector & terminal***
(ABS1) No. 2 — Valve relay installing point No. 30
Is resistance less than 0.5 Ω?

YES : Go to step **8K8.**

NO : Replace relay box.



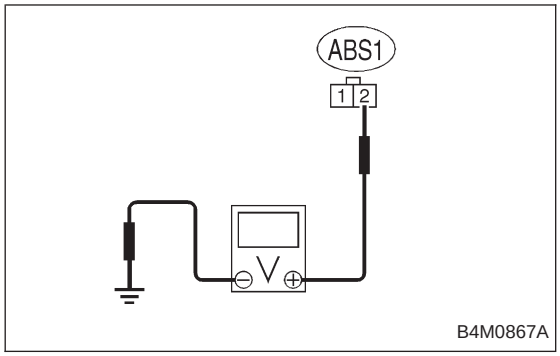
8K8	CHECK GROUND SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.

Measure resistance between hydraulic unit connector and chassis ground.

CHECK ***: Connector & terminal***
(ABS1) No. 2 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8K9.**

NO : Replace relay box. Check fuse SBF6.



8K9	CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.

1) Disconnect connector from ABSCM.
2) Turn ignition switch to ON.
3) Measure voltage between hydraulic unit connector and chassis ground.

CHECK ***: Connector & terminal***
(ABS1) No. 2 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

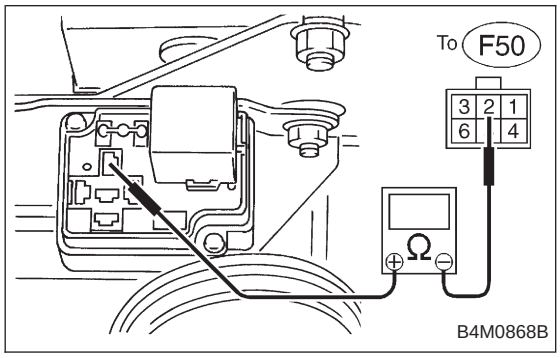
NO : Replace relay box. Check fuse No. 19 and SBF6.

4) Turn ignition switch to OFF.
5) Measure voltage between hydraulic unit connector and chassis ground.

CHECK ***: Connector & terminal***
(ABS1) No. 2 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8K10.**

NO : Replace relay box. Check fuse No. 19 and SBF6.



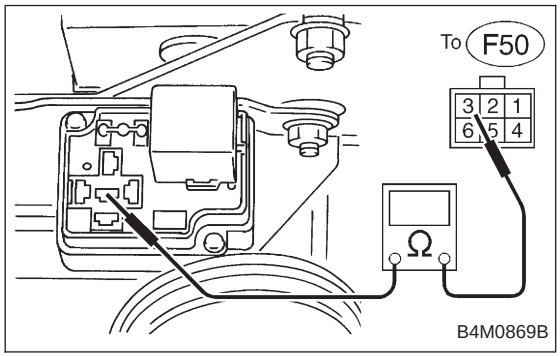
8K10	CHECK DIODE OF RELAY BOX.

Measure resistance between relay box connector and valve relay installing point.

CHECK ***: Connector & terminal***
Valve relay installing point No. 30 (+) — To (F50) No. 2 (−)
Is resistance more than 1 MΩ?

YES : Go to step **8K11.**

NO : Replace relay box.



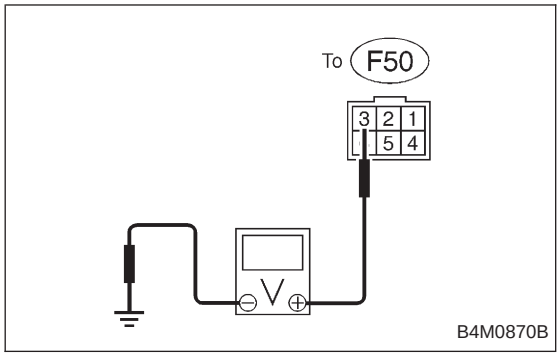
8K11	CHECK BROKEN WIRE IN GROUND CIRCUIT OF RELAY BOX.

Measure resistance between relay box connector and valve relay installing point.

CHECK ***: Connector & terminal***
To (F50) No. 3 — Valve relay installing point No. 87a
Is resistance less than 0.5 Ω?

YES : Go to step **8K12.**

NO : Replace relay box.



8K12	CHECK BATTERY SHORT IN GROUND CIRCUIT OF RELAY BOX.

1) Turn ignition switch to ON.
2) Measure voltage between relay box connector and chassis ground.

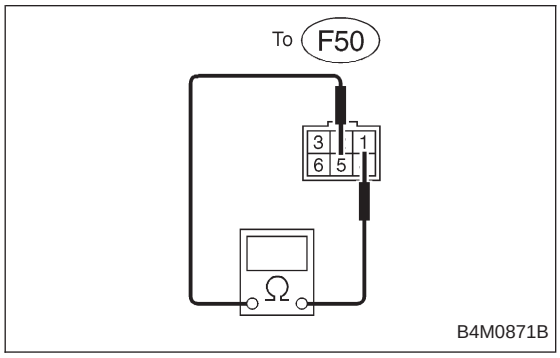
CHECK : ***Connector & terminal***
To (F50) No. 3 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.
NO : Replace relay box and check all fuses.

3) Turn ignition switch to OFF.
4) Measure voltage between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
To (F50) No. 3 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8K13.**
NO : Replace relay box and check all fuses.

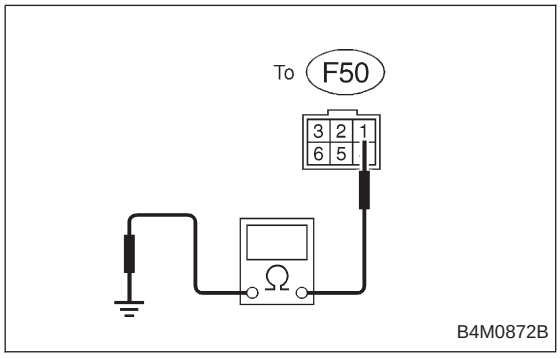


8K13	CHECK BROKEN WIRE IN CONTROL CIRCUIT OF RELAY BOX.

1) Install valve relay to relay box.
2) Measure resistance between relay box connector terminals.

CHECK : ***Connector & terminal***
To (F50) No. 1 — No. 5
Is resistance 103±10 Ω?

YES : Go to step **8K14.**
NO : Replace relay box.

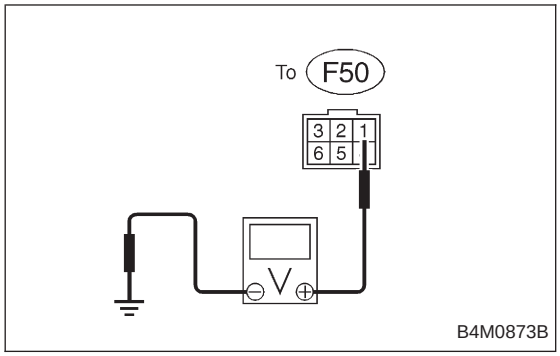


8K14	CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.

Measure resistance between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
To (F50) No. 1 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8K15.**
NO : Replace relay box and check all fuses.



8K15	CHECK BATTERY SHORT IN CONTROL CIRCUIT OF RELAY BOX.

1) Turn ignition switch to ON.
2) Measure voltage between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
To (F50) No. 1 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

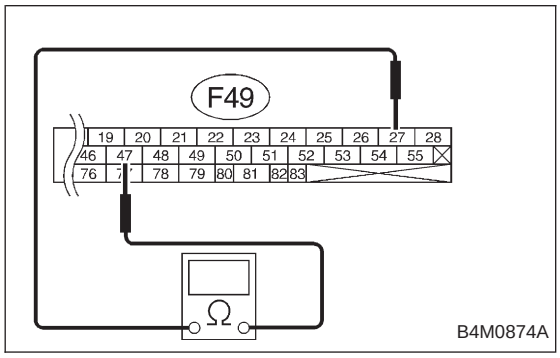
NO : Replace relay box. Check fuse No. 19 and SBF45A.

3) Turn ignition switch to OFF.
4) Measure voltage between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
To (F50) No. 1 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8K16.**

NO : Replace relay box. Check fuse No. 19 and SBF45A.



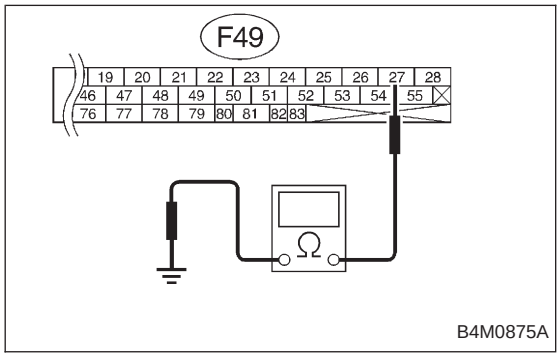
8K16	CHECK BROKEN WIRE IN CONTROL SYSTEM HARNESS OF VALVE RELAY.

1) Connect connector (F50) to relay box.
2) Measure resistance between ABSCM connector terminals.

CHECK : ***Connector & terminal***
(F49) No. 27 — No. 47
Is resistance 103±10 Ω?

YES : Go to step **8K17.**

NO : Repair harness between ABSCM and relay box. Check fuse No. 18.



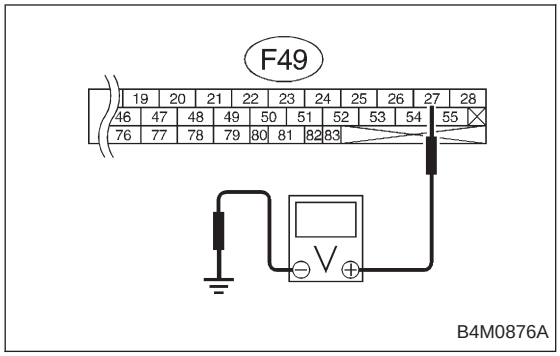
8K17	CHECK GROUND SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.

Measure resistance between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 27 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8K18.**

NO : Repair harness between ABSCM and relay box. Check fuse No. 18.



8K18	CHECK BATTERY SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 27 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

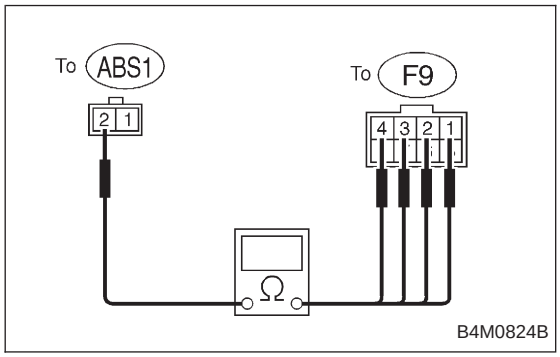
NO : Repair harness between ABSCM and relay box and check all fuses.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 27 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8K19.**

NO : Repair harness between ABSCM and relay box and check all fuses.



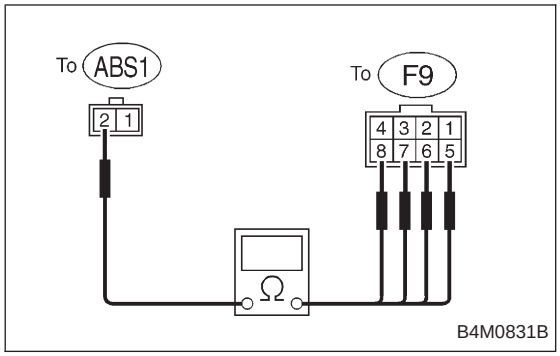
8K19	CHECK RESISTANCE OF INLET SOLENOID VALVE.

1) Disconnect connector from hydraulic unit.
2) Measure resistance between hydraulic unit connector terminals.

CHECK : ***Connector & terminal***
To (F9) No. 4 — to (ABS1) No. 2
To (F9) No. 1 — to (ABS1) No. 2
To (F9) No. 2 — to (ABS1) No. 2
To (F9) No. 3 — to (ABS1) No. 2
Is resistance 8.5±0.7 Ω?

YES : Go to step **8K20.**

NO : Replace hydraulic unit.



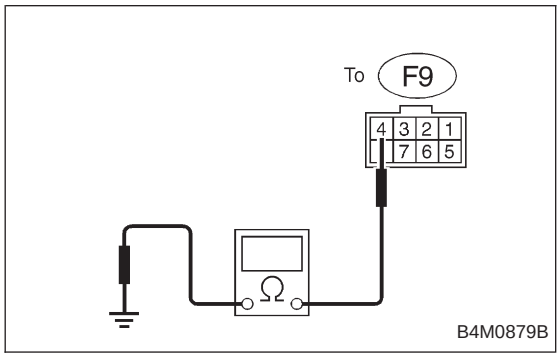
8K20	CHECK RESISTANCE OF OUTLET SOLENOID VALVE.

Measure resistance between hydraulic unit connector terminals.

CHECK : ***Connector & terminal***
To (F9) No. 8 — to (ABS1) No. 2
To (F9) No. 5 — to (ABS1) No. 2
To (F9) No. 6 — to (ABS1) No. 2
To (F9) No. 7 — to (ABS1) No. 2
Is resistance 4.3±0.5 Ω?

YES : Go to step **8K21.**

NO : Replace hydraulic unit.



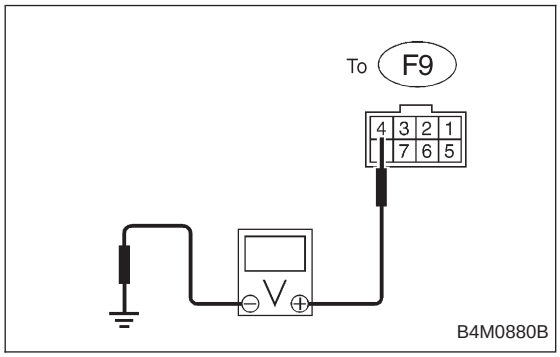
8K21	CHECK GROUND SHORT OF SOLENOID VALVE.

Measure resistance between hydraulic unit connector and chassis ground.

CHECK : ***Connector & terminal***
To (F9) No. 4 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8K22.**

NO : Replace hydraulic unit and check all fuses.



8K22	CHECK BATTERY SHORT OF SOLENOID VALVE.

1) Turn ignition switch to ON.
2) Measure voltage between hydraulic unit connector and chassis ground.

CHECK : ***Connector & terminal***
To (F9) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

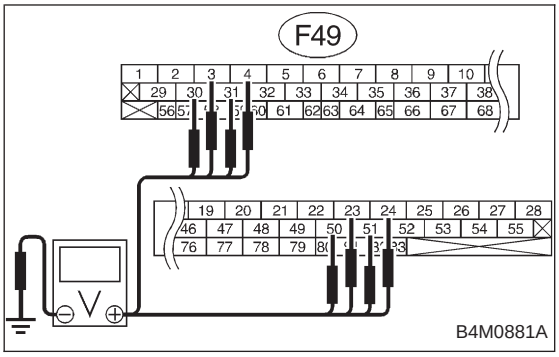
NO : Replace hydraulic unit and check all fuses.

3) Turn ignition switch to OFF.
4) Measure voltage between hydraulic unit connector and chassis ground.

CHECK : ***Connector & terminal***
To (F9) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8K23.**

NO : Replace hydraulic unit and check all fuses.



8K23	CHECK BATTERY SHORT OF HARNESS.

1) Disconnect connector from hydraulic unit.
2) Turn ignition switch to ON.
3) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 30 (+) — Chassis ground (−)
(F49) No. 24 (+) — Chassis ground (−)
(F49) No. 23 (+) — Chassis ground (−)
(F49) No. 31 (+) — Chassis ground (−)
(F49) No. 3 (+) — Chassis ground (−)
(F49) No. 51 (+) — Chassis ground (−)
(F49) No. 50 (+) — Chassis ground (−)
(F49) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

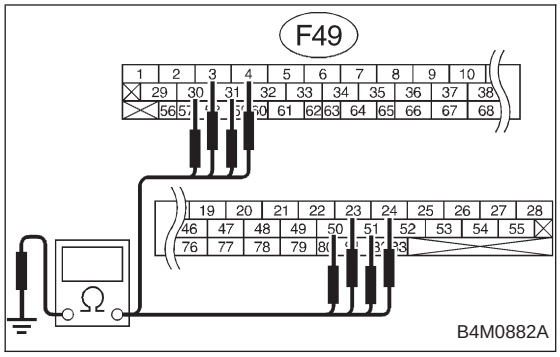
NO : Repair harness between hydraulic unit and ABSCM and check all fuses.

4) Turn ignition switch to OFF.
5) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 30 (+) — Chassis ground (−)
(F49) No. 24 (+) — Chassis ground (−)
(F49) No. 23 (+) — Chassis ground (−)
(F49) No. 31 (+) — Chassis ground (−)
(F49) No. 3 (+) — Chassis ground (−)
(F49) No. 51 (+) — Chassis ground (−)
(F49) No. 50 (+) — Chassis ground (−)
(F49) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8K24.**

NO : Repair harness between hydraulic unit and ABSCM and check all fuses.



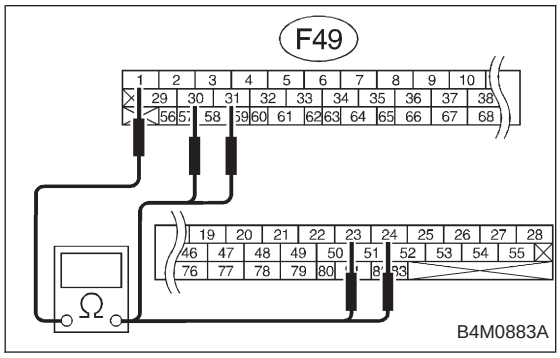
8K24	CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 30 — Chassis ground
(F49) No. 24 — Chassis ground
(F49) No. 23 — Chassis ground
(F49) No. 31 — Chassis ground
(F49) No. 3 — Chassis ground
(F49) No. 51 — Chassis ground
(F49) No. 50 — Chassis ground
(F49) No. 4 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8K25.**

NO : Repair harness between hydraulic unit and ABSCM.



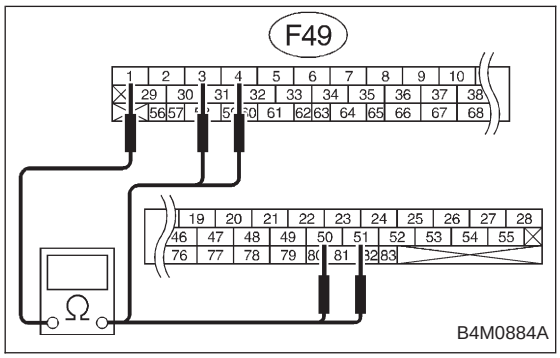
8K25	CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

1) Connect connector to hydraulic unit.
2) Measure resistance between ABSCM connector terminals.

CHECK ***: Connector & terminal***
(F49) No. 30 — No. 1
(F49) No. 24 — No. 1
(F49) No. 23 — No. 1
(F49) No. 31 — No. 1
Is resistance 9.0±0.7 Ω?

YES : Go to next CHECK .

NO : Repair harness connector between hydraulic unit and ABSCM.



CHECK ***: Connector & terminal***
(F49) No. 3 — No. 1
(F49) No. 51 — No. 1
(F49) No. 50 — No. 1
(F49) No. 4 — No. 1
Is resistance 4.8±0.5 Ω?

YES : Go to step **8K26.**

NO : Repair harness connector between hydraulic unit and ABSCM.

8K26	**CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

CHECK ***: Is there poor contact in connector between ABSCM and hydraulic unit?***

YES : Repair connector.

NO : Go to step **8K27.**

8K27	**CHECK ABSCM.**

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

L: TROUBLE CODE 52 — ABNORMAL MOTOR AND/OR MOTOR RELAY —

DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

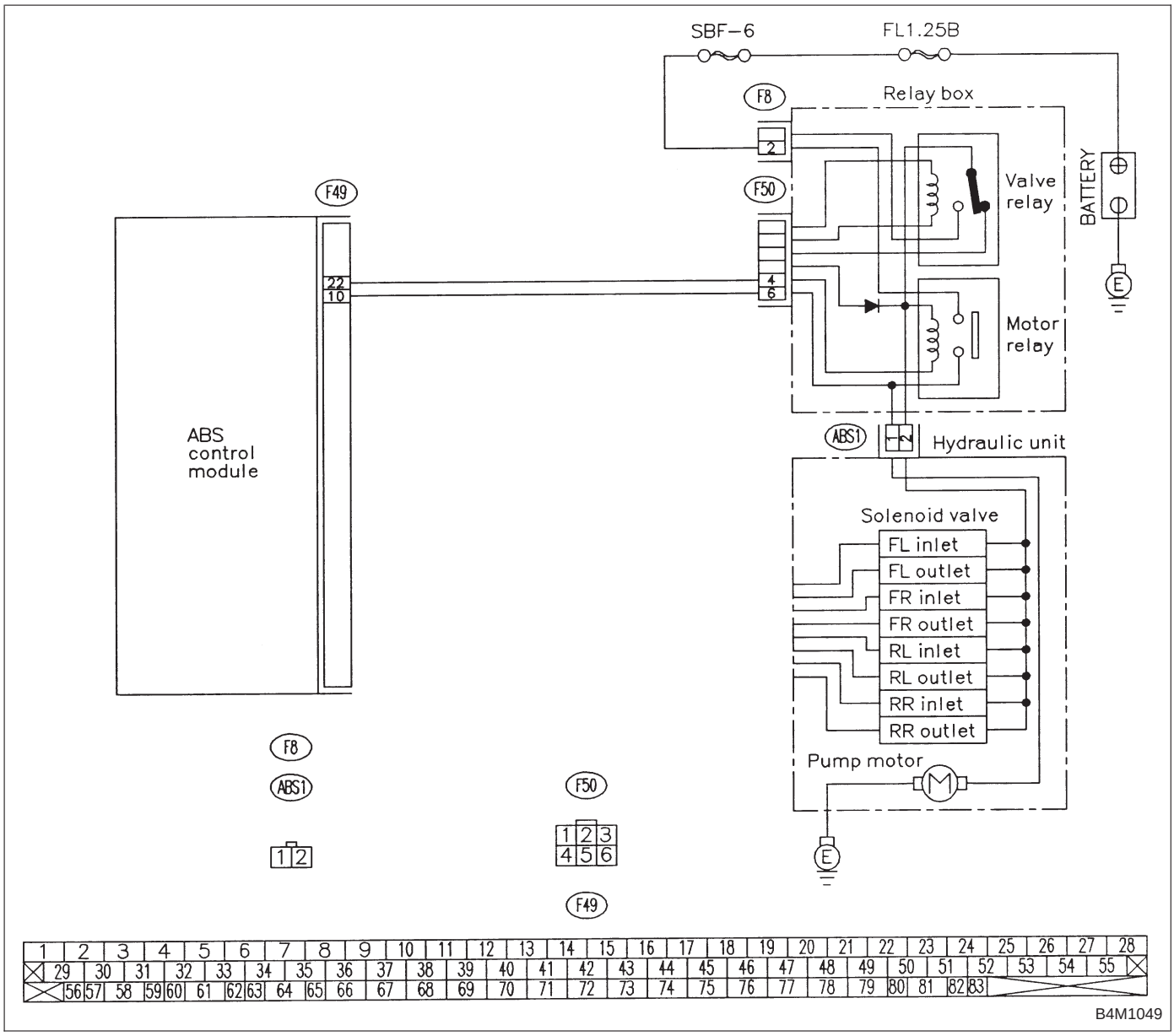
8L1.	Check resistance of motor relay.
8L2.	Check contact point of motor relay.
8L3.	Check short of motor relay.
8L4.	Check input voltage of relay box.
8L5.	Check input voltage of motor relay.
8L6.	Check broken wire in contact point circuit of relay box.
8L7.	Check ground short in contact point circuit of relay box.
8L8.	Check battery short in contact point circuit of relay box.
8L9.	Check broken wire in monitor system circuit of relay box.
8L10.	Check broken wire in control circuit of relay box.
8L11.	Check ground short in control circuit of relay box.
8L12.	Check battery short in control circuit of relay box.
8L13.	Check broken wire in monitor system harness.
8L14.	Check broken wire in relay control system harness.
8L15.	Check ground short between relay box and ABSCM.

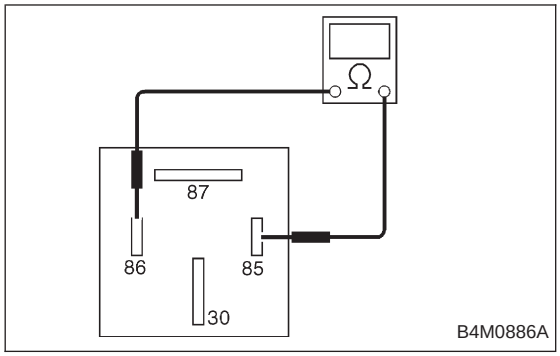
Continues to next page.

From the former page.

8L16.	Check battery short between relay box and ABSCM.
8L17.	Check ground short at ABSCM monitor terminal.
8L18.	Check battery short at ABSCM monitor terminal.
8L19.	Check motor ground.
8L20.	Check ABSCM motor drive terminal.
8L21.	Check motor operation.
8L22.	Check poor contact in connector between hydraulic unit, relay box and ABSCM.
8L23.	Check ABSCM.

WIRING DIAGRAM:





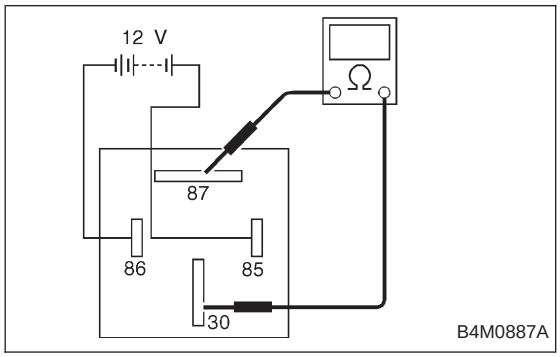
8L1	CHECK RESISTANCE OF MOTOR RELAY.

1) Turn ignition switch to OFF.
2) Remove motor relay from relay box.
3) Measure resistance between motor relay terminals.

CHECK : ***Terminals***
No. 85 — No. 86
Is resistance 80±10 Ω?

YES : Go to step **8L2.**

NO : Replace motor relay.



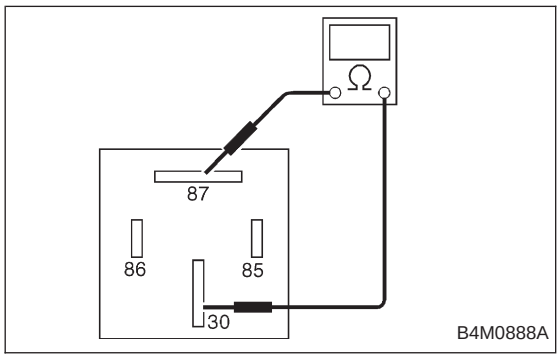
8L2	CHECK CONTACT POINT OF MOTOR RELAY.

1) Connect battery to motor relay terminals No. 85 and No. 86.
2) Measure resistance between motor relay terminals.

CHECK : ***Terminals***
No. 30 — No. 87
Is resistance less than 0.5 Ω?

YES : Go to next step.

NO : Replace motor relay.

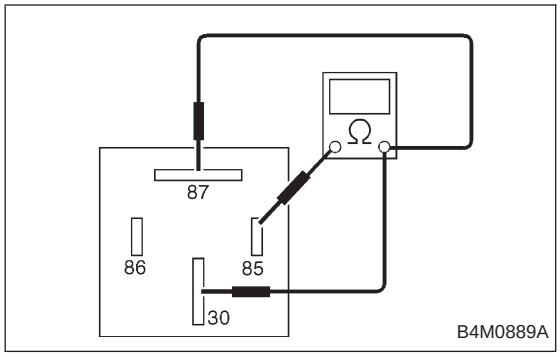


3) Disconnect battery from motor relay terminals.
4) Measure resistance between motor relay terminals.

CHECK : ***Terminals***
No. 30 — No. 87
Is resistance more than 1 MΩ?

YES : Go to step **8L3.**

NO : Replace motor relay.



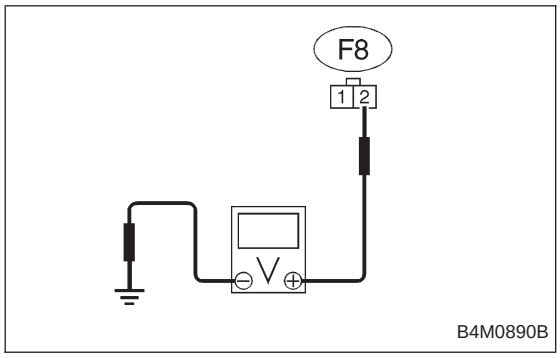
8L3	CHECK SHORT OF MOTOR RELAY.

Measure resistance between motor relay terminals.

CHECK : ***Terminals***
No. 85 — No. 30
No. 85 — No. 87
Is resistance more than 1 MΩ?

YES : Go to step **8L4.**

NO : Replace motor relay.



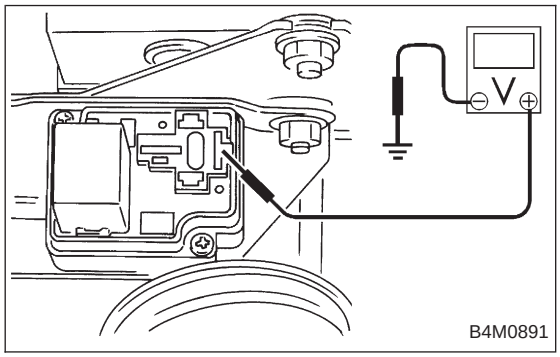
8L4	CHECK INPUT VOLTAGE OF RELAY BOX.

1) Disconnect connector (F8) from relay box.
2) Measure voltage between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
(F8) No. 2 (+) — Chassis ground (−)
Is voltage 10 — 13 V?

YES : Go to step **8L5.**

NO : Repair harness connector between battery and relay box. Check fuse SBF6.



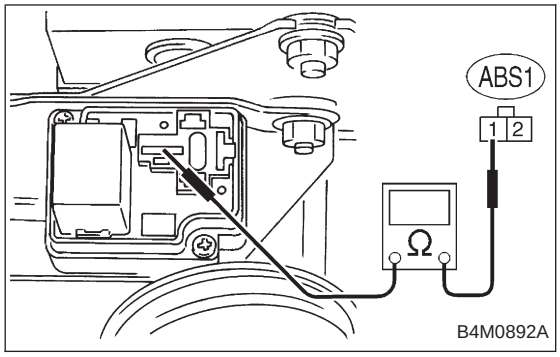
8L5	CHECK INPUT VOLTAGE OF MOTOR RELAY.

1) Connect connector (F8) to relay box.
2) Measure voltage between relay box and chassis ground.

CHECK : ***Connector & terminal***
Relay installing point No. 87 (+) — Chassis ground (−)
Is voltage more than 10 V?

YES : Go to step **8L6.**

NO : Replace relay box. Check fuse SBF6.



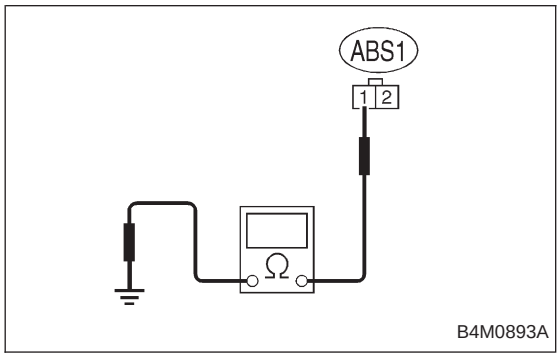
8L6	CHECK BROKEN WIRE IN CONTACT POINT CIRCUIT OF RELAY BOX.

1) Disconnect connector (ABS1) from hydraulic unit.
2) Measure resistance between hydraulic unit and motor relay installing portion.

CHECK : ***Connector & terminal***
(ABS1) No. 1 — Motor relay installing portion No. 30
Is resistance less than 0.5 Ω?

YES : Go to step **8L7.**

NO : Replace relay box.



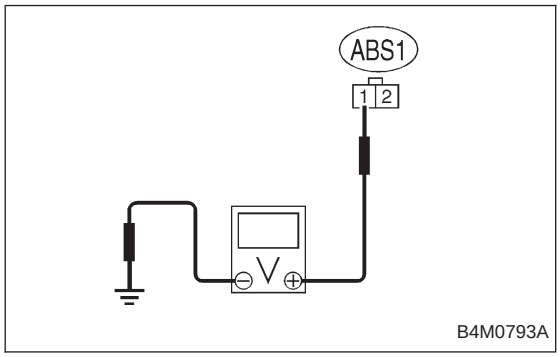
8L7	CHECK GROUND SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.

Measure resistance between hydraulic unit and chassis ground.

CHECK : ***Connector & terminal***
(ABS1) No. 1 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8L8.**

NO : Replace relay box. Check fuse No. 19.



8L8	CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.

1) Disconnect connector from ABSCM.
2) Turn ignition switch to ON.
3) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(ABS1) No. 1 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

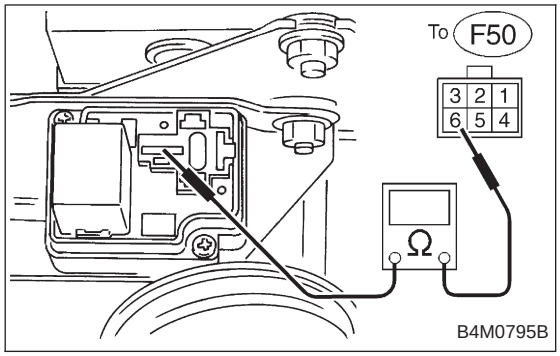
NO : Replace relay box.

4) Turn ignition switch to OFF.
5) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(ABS1) No. 1 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8L9.**

NO : Replace relay box.



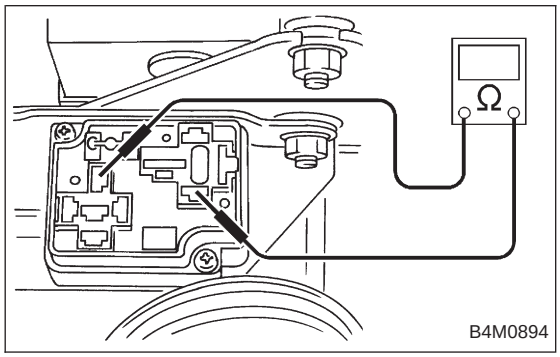
8L9	CHECK BROKEN WIRE IN MONITOR SYSTEM CIRCUIT OF RELAY BOX.

1) Disconnect connector (F50) from relay box.
2) Measure resistance between relay box connector and motor relay installing point.

CHECK ***: Connector & terminal***
To (F50) No. 6 — Motor relay installing point No. 30
Is resistance less than 0.5 Ω?

YES : Go to step **8L10.**

NO : Replace relay box.



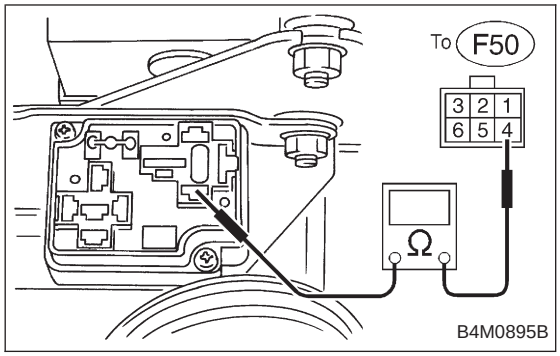
8L10	CHECK BROKEN WIRE IN CONTROL CIRCUIT OF RELAY BOX.

1) Remove valve relay from relay box.
2) Measure resistance between motor relay installing point and valve relay installing point.

CHECK ***: Connector & terminal***
Motor relay installing point No. 86 — Valve relay installing point No. 30
Is resistance less than 0.5 Ω?

YES : Go to next step.

NO : Replace relay box.

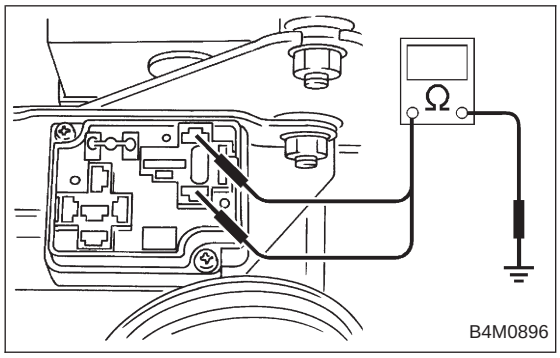


3) Measure resistance between motor relay installing point and relay box connector.

CHECK : ***Connector & terminal***
Motor relay installing point No. 86 — To (F50) No. 4
Is resistance less than 0.5 Ω?

YES : Go to step **8L11.**

NO : Replace relay box.



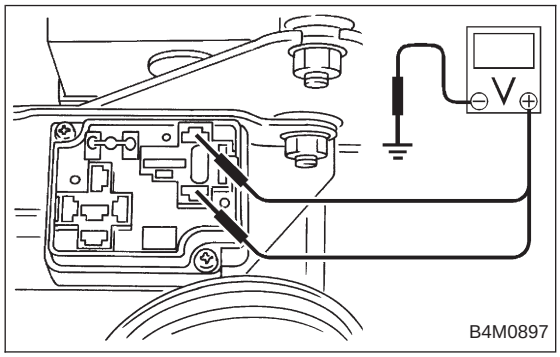
8L11	CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.

Measure resistance between relay box and chassis ground.

CHECK : ***Connector & terminal***
Motor relay installing point No. 86 — Chassis ground
Motor relay installing point No. 85 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8L12.**

NO : Replace relay box. Check fuse No. 19.



8L12	CHECK BATTERY SHORT IN CONTROL CIRCUIT OF RELAY BOX.

1) Turn ignition switch to ON.
2) Measure voltage between motor relay installing point and chassis ground.

CHECK : ***Connector & terminal***
Motor relay installing point (+) No. 86 — Chassis ground (−)
Motor relay installing point (+) No. 85 — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

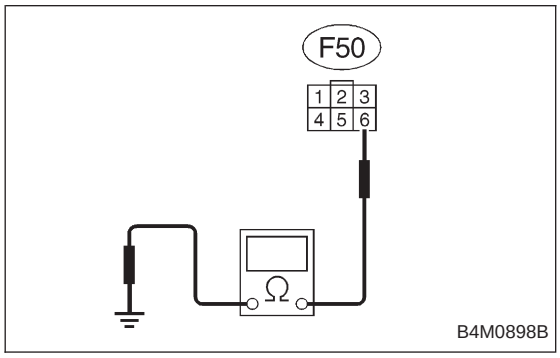
NO : Replace relay box and check all fuses.

3) Turn ignition switch to OFF.
4) Measure voltage between motor relay installing point and chassis ground.

CHECK ***: Connector & terminal***
Motor relay installing point (+) No. 86 — Chassis ground
Motor relay installing point (+) No. 85 — Chassis ground
Is voltage 0 V?

YES : Go to step **8L13.**

NO : Replace relay box and check all fuses.



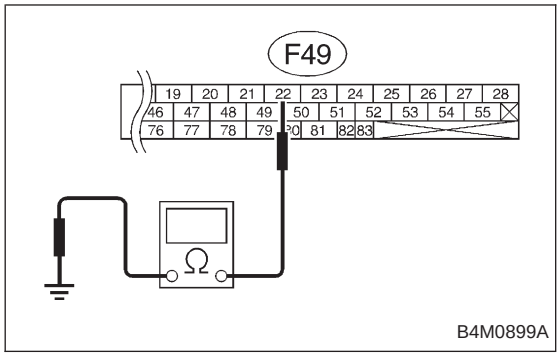
8L13	CHECK BROKEN WIRE IN MONITOR SYSTEM HARNESS.

1) Connect between terminals No. 10 and No. 1 of ABSCM connector (F49) with a lead wire.
2) Measure resistance between relay box connector and chassis ground.

CHECK ***: Connector & terminal***
(F50) No. 6 — Chassis ground
Is resistance less than 0.5 Ω?

YES : Go to step **8L14.**

NO : Repair harness connector between ABSCM and relay box.



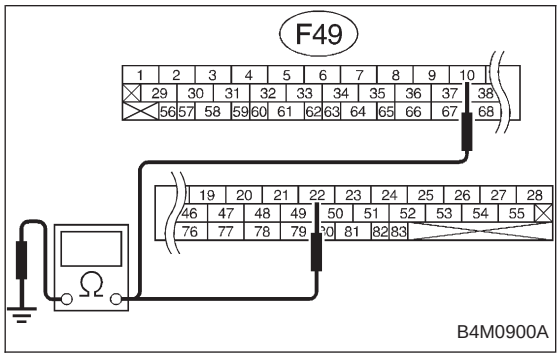
8L14	CHECK BROKEN WIRE IN RELAY CONTROL SYSTEM HARNESS.

1) Connect valve relay and motor relay to relay box.
2) Connect connector (F50) to relay box.
3) Connect connector to hydraulic unit.
4) Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 22 — Chassis ground
Is resistance 80±10 Ω?

YES : Go to step **8L15.**

NO : Repair harness connector between ABSCM and relay box.



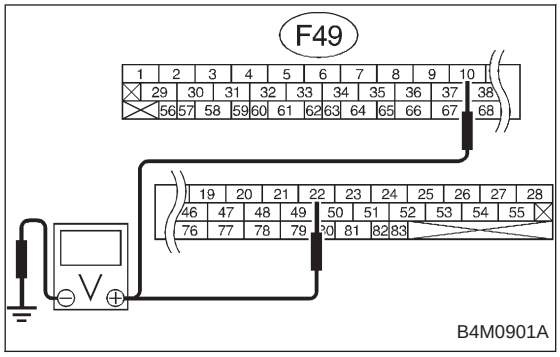
8L15	CHECK GROUND SHORT BETWEEN RELAY BOX AND ABSCM.

1) Disconnect connector (F50) from relay box.
2) Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 22 — Chassis ground
(F49) No. 10 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8L16.**

NO : Repair harness between ABSCM and relay box. Check fuse No. 19 and SBF6.



8L16	CHECK BATTERY SHORT BETWEEN RELAY BOX AND ABSCM.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM and chassis ground.

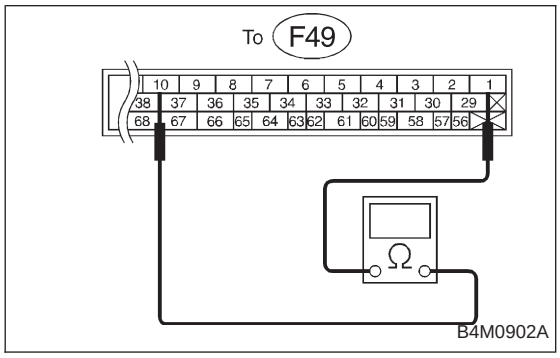
CHECK : ***Connector & terminal***
(F49) No. 22 (+) — Chassis ground (−)
(F49) No. 10 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.
NO : Repair harness between relay box and ABSCM. Check fuse SBF6.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 22 (+) — Chassis ground (−)
(F49) No. 10 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8L17.**
NO : Repair harness between relay box and ABSCM. Check fuse SBF6.

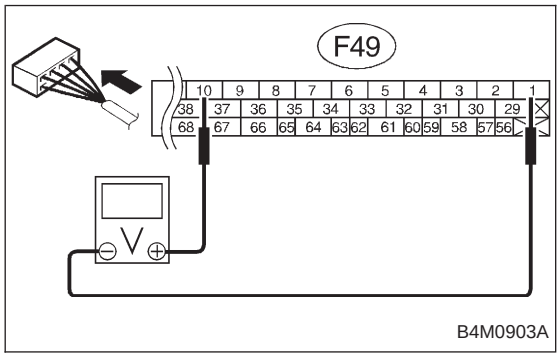


8L17	CHECK GROUND SHORT AT ABSCM MONITOR TERMINAL.

Measure resistance between ABSCM terminals.

CHECK : ***Connector & terminal***
To (F49) No. 10 — No. 1
Is resistance less than 0.5 Ω?

YES : Go to step **8L18.**
NO : Replace ABSCM.



8L18	CHECK BATTERY SHORT AT ABSCM MONITOR TERMINAL.

1) Disconnect connector cover from ABSCM connector. <Ref. to 4-4c [T8C1] steps 5) to 8).>
2) Connect all connectors.
3) Turn ignition switch to ON.
4) Measure voltage between ABSCM connector terminals.

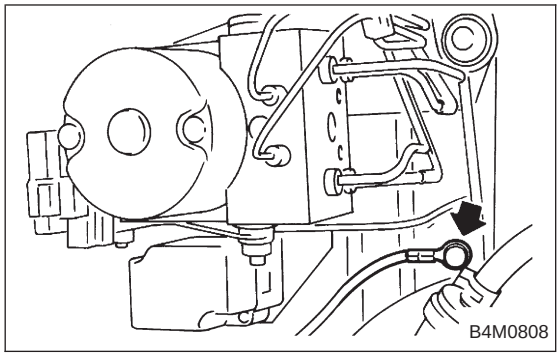
CHECK : ***Connector & terminal***
(F49) No. 10 (+) — No. 1 (−)
Is voltage less than 2 V?

YES : Go to next step.
NO : Replace ABSCM.

5) Turn ignition switch to OFF.
6) Measure voltage between ABSCM connector terminals.

CHECK : ***Connector & terminal***
(F49) No. 10 (+) — No. 1 (−)
Is voltage less than 2 V?

YES : Go to step **8L19.**
NO : Replace ABSCM.

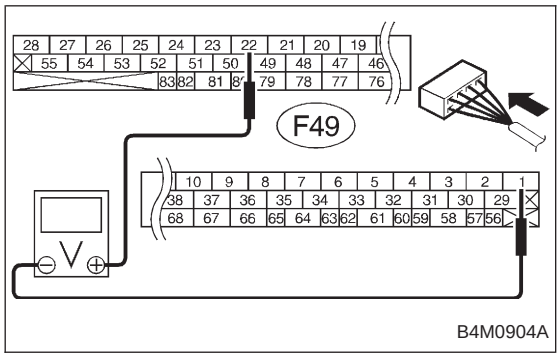

B4M0808

8L19	CHECK MOTOR GROUND.

CHECK : ***Tightening torque: 32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb) Is the motor ground terminal tightly clamped?***

YES : Go to step **8L20.**

NO : Tighten the clamp of motor ground terminal.



B4M0904A

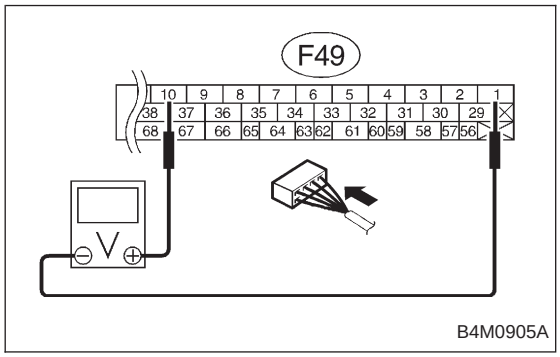
8L20	CHECK ABSCM MOTOR DRIVE TERMINAL.

1) Measure voltage between ABSCM connector terminals.
2) Operate the check sequence. <Ref. to 4-4 [W22D1].>

CHECK : ***Connector & terminal (F49) No. 22 (+) — No. 1 (−) Does the voltage drop from 10 — 13 V to less than 1.5 V, and rise to 10 — 13 V again when carrying out the check sequence?***

YES : Go to step **8L21.**

NO : Replace ABSCM.



B4M0905A

8L21	CHECK MOTOR OPERATION.

1) Measure voltage between ABSCM connector terminals.
2) Operate the check sequence. <Ref. to 4-4 [W22D1].>

CHECK : ***Connector & terminal (F49) No. 10 (+) — No. 1 (−) Does the voltage raise from less than 1.5 V to 10 — 13 V, and return to less than 1.5 V again when carrying out the check sequence? Can motor revolution noise (buzz) be heard when carrying out the check sequence?***

YES : Go to step **8L22.**

NO : Replace hydraulic unit.

8L22	**CHECK POOR CONTACT IN CONNECTOR BETWEEN HYDRAULIC UNIT, RELAY BOX AND ABSCM.**

CHECK ***: Is there poor contact in connector between hydraulic unit, relay box and ABSCM?***

YES : Repair connector.

NO : Go to step **8L23.**

8L23	**CHECK ABSCM.**

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

M: TROUBLE CODE 54 — ABNORMAL STOP LIGHT SWITCH —

DIAGNOSIS:

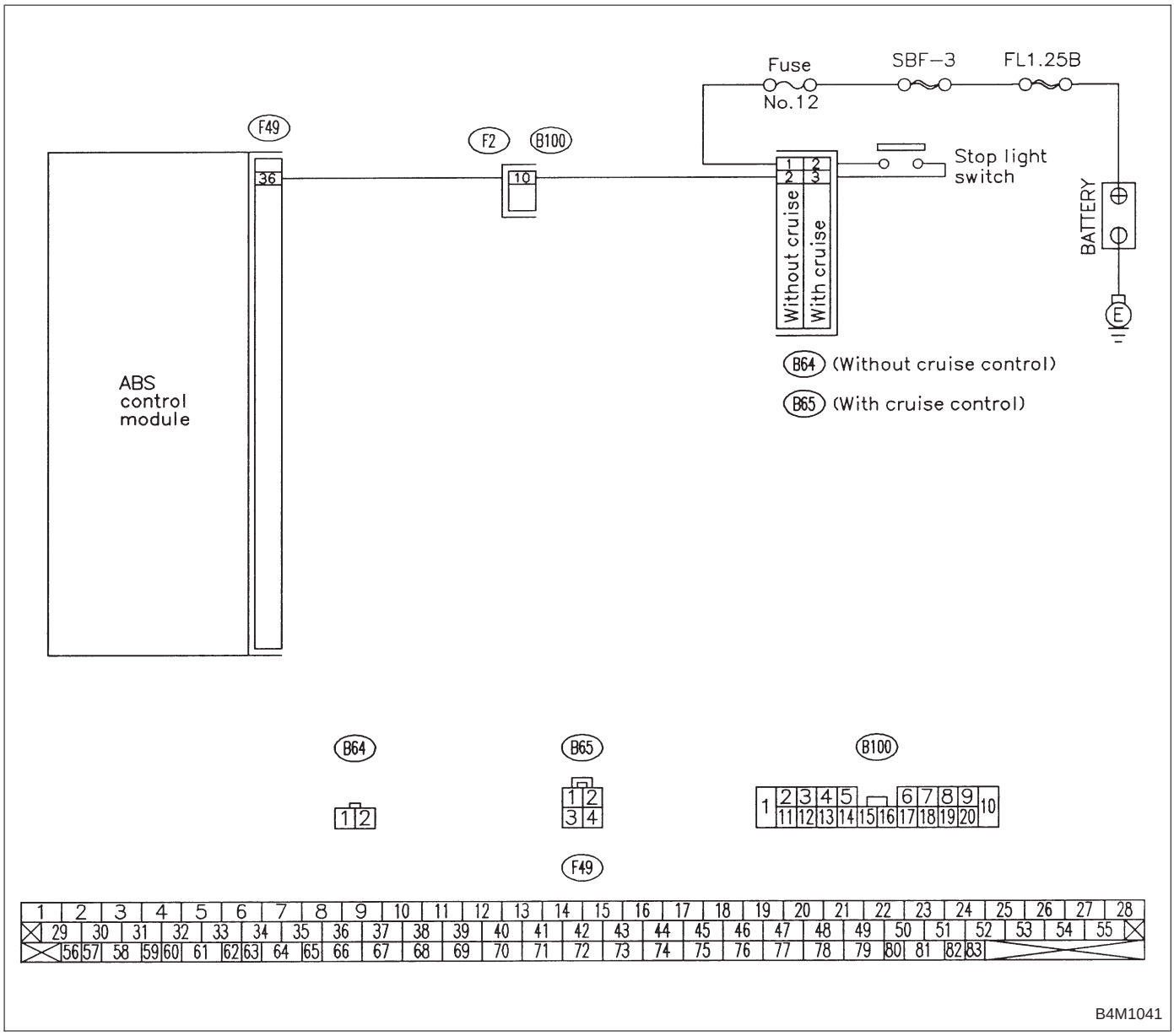
- Faulty stop light switch

TROUBLE SYMPTOM:

- ABS does not operate.

8M1.	**Check if stop lights come on.**
↓	
8M2.	**Check open circuit of harness.**
↓	
8M3.	**Check poor contact in connector between stop light switch and ABSCM.**
↓	
8M4.	**Check ABSCM.**

WIRING DIAGRAM:



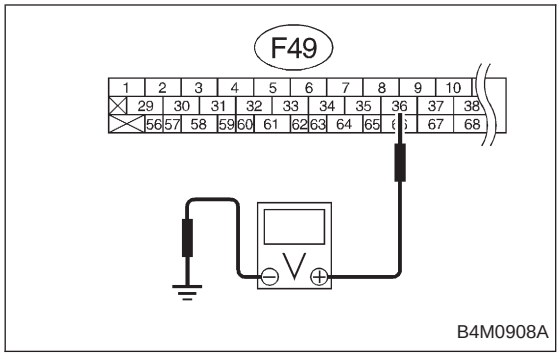
8M1	CHECK IF STOP LIGHTS COME ON.

Depress the brake pedal.

CHECK ***: Do stop lights turn on?***

YES : Go to step **8M2.**

NO : Repair stop lights circuit.



8M2	CHECK OPEN CIRCUIT OF HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM.
3) Depress brake pedal.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal (F49) No. 36 — Chassis ground Is voltage 10 — 13 V?***

YES : Go to step **8M3.**

NO : Repair harness between stop light switch and ABSCM.

8M3	CHECK POOR CONTACT IN CONNECTOR BETWEEN STOP LIGHT SWITCH AND ABSCM.

CHECK ***: Is there poor contact in connector between stop light switch and ABSCM?***

YES : Repair connector.

NO : Go to step **8M4.**

8M4	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

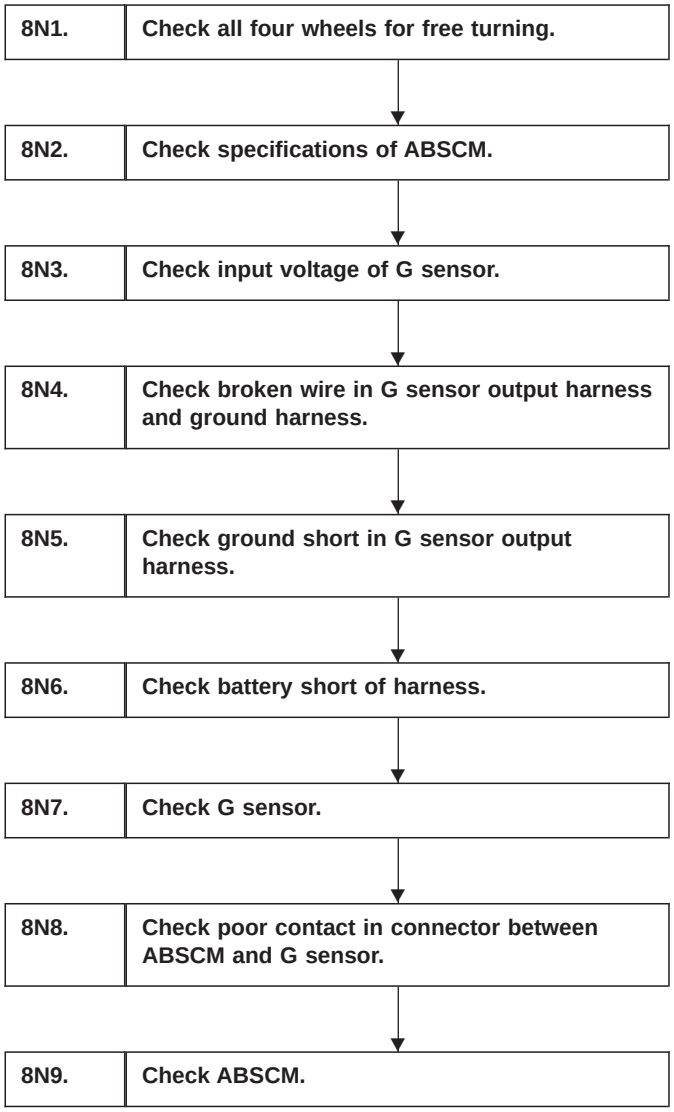
N: TROUBLE CODE 56 — ABNORMAL G SENSOR OUTPUT VOLTAGE —

DIAGNOSIS:

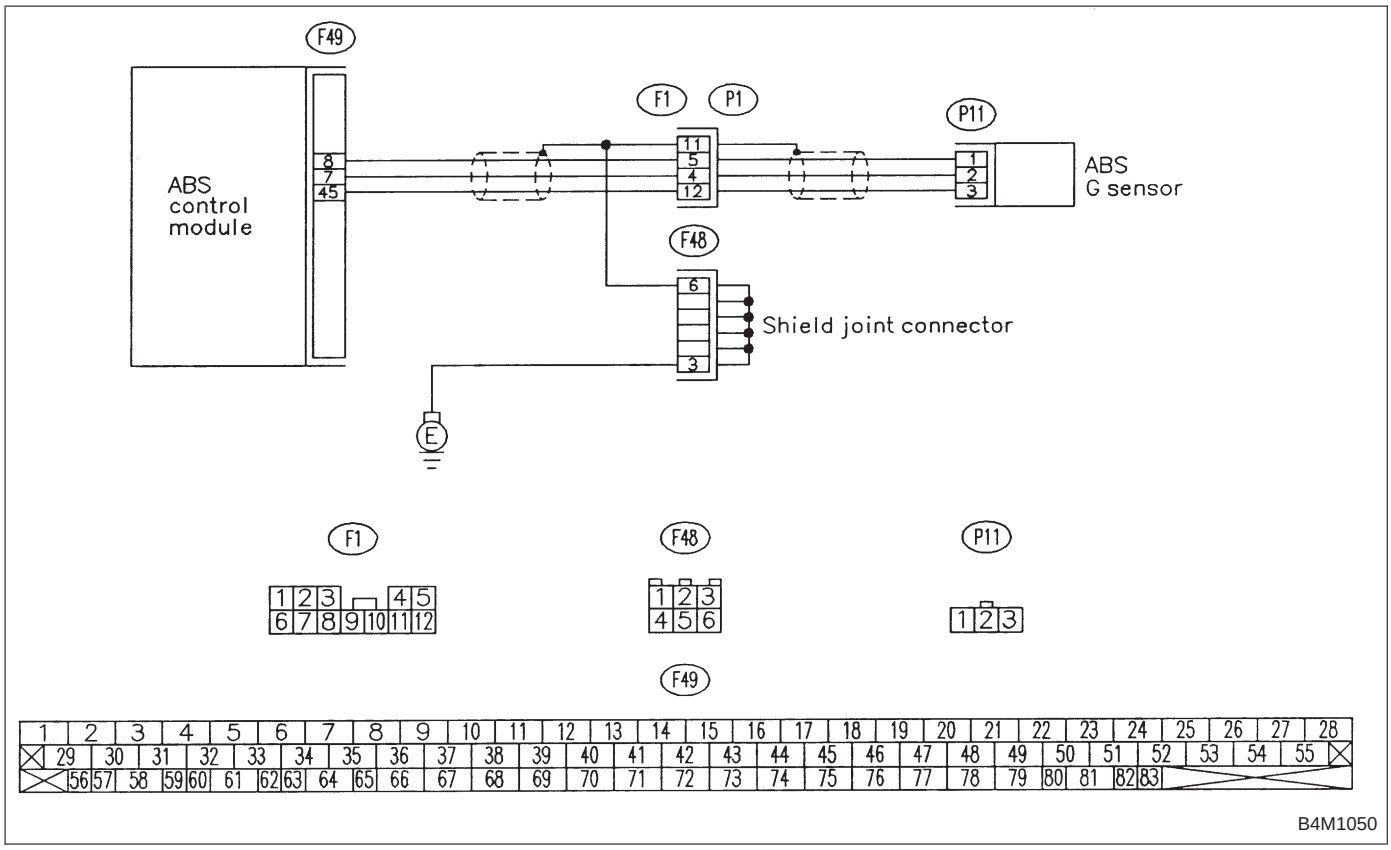
- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.



WIRING DIAGRAM:



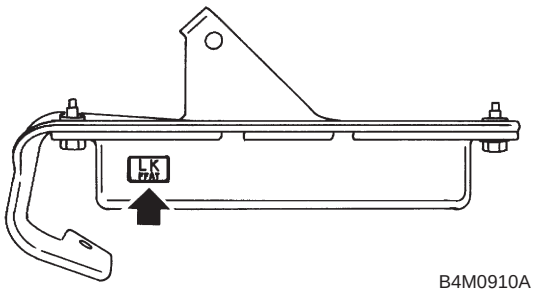
8N1	CHECK ALL FOUR WHEELS FOR FREE TURNING.

CHECK : ***Have the wheels been turned freely such as when the vehicle is lifted up, or operated on a rolling road?***

YES : The ABS is normal. Erase the trouble code.

NO : Go to step **8N2.**

LHD model



8N2	CHECK SPECIFICATIONS OF ABSCM.

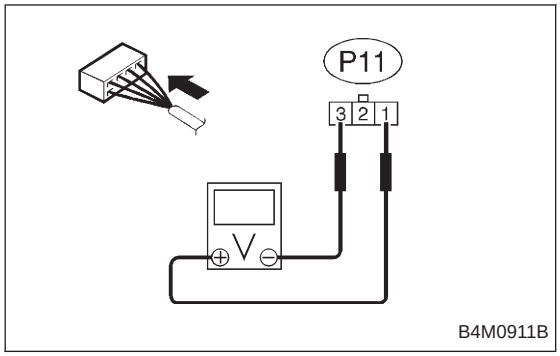
Check specifications of the plate attached to the ABSCM.

CHECK : ***Is an ABSCM for 4WD model installed on a FWD model?***

CAUTION:
Be sure to turn ignition switch to OFF when removing ABSCM.

YES : Replace ABSCM.

NO : Go to step **8N3.**



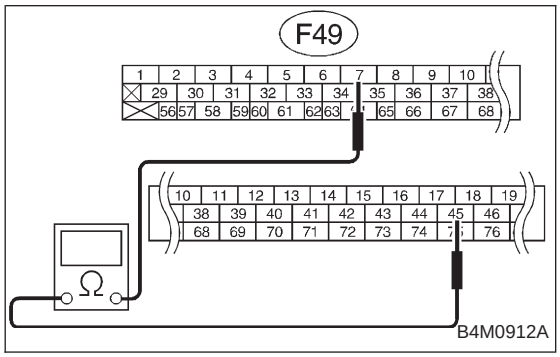
8N3	CHECK INPUT VOLTAGE OF G SENSOR.

1) Turn ignition switch to OFF.
2) Remove console box.
3) Disconnect G sensor from body. (Do not disconnect connector.)
4) Turn ignition switch to ON.
5) Measure voltage between G sensor connector terminals.

CHECK ***: Connector & terminal***
(P11) No. 1 (+) — No. 3 (−)
Is voltage 5±0.25 V?

YES : Go to step **8N4.**

NO : Repair harness connector between G sensor and ABSCM.



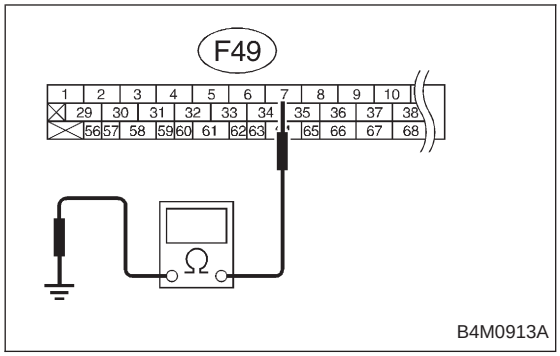
8N4	CHECK BROKEN WIRE IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM.
3) Measure resistance between ABSCM connector terminals.

CHECK ***: Connector & terminal***
(F49) No. 7 — No. 45
Is resistance 4.6±0.3 kΩ?

YES : Go to step **8N5.**

NO : Repair harness between G sensor and ABSCM.



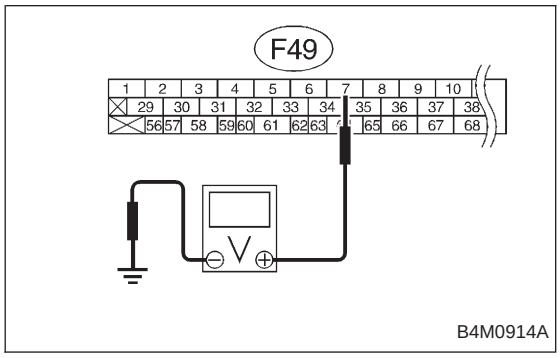
8N5	CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS.

1) Disconnect connector from G sensor.
2) Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 7 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **8N6.**

NO : Repair harness between G sensor and ABSCM.



8N6	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 7 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

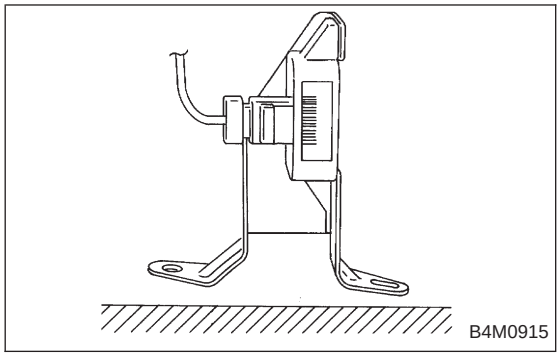
NO : Repair harness between G sensor and ABSCM.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 7 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **8N7.**

NO : Repair harness between G sensor and ABSCM.



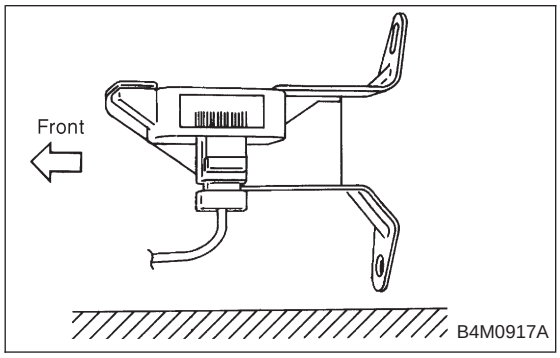
8N7	CHECK G SENSOR.

1) Remove G sensor from vehicle.
2) Connect connector to G sensor.
3) Connect connector to ABSCM.
4) Turn ignition switch to ON.
5) Measure voltage between G sensor connector terminals.

CHECK : ***Connector & terminal (P11) No. 2 (+) — No. 1 (−) Is voltage 2.3±0.2 V when G sensor is horizontal?***

YES : Go to next CHECK .

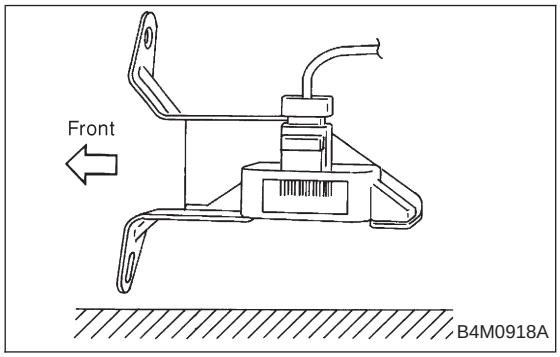
NO : Replace G sensor.



CHECK : ***Connector & terminal (P11) No. 2 (+) — No. 1 (−) Is voltage 3.9±0.2 V when G sensor is inclined forwards to 90°?***

YES : Go to next CHECK .

NO : Replace G sensor.



CHECK : ***Connector & terminal (P11) No. 2 (+) — No. 1 (−) Is voltage 0.7±0.2 V when G sensor is inclined backwards to 90°?***

YES : Go to step **8N8.**

NO : Replace G sensor.

8N8	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.

CHECK : ***Is there poor contact in connector between ABSCM and G sensor?***

YES : Repair connector.

NO : Go to step **8N9.**

8N9	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

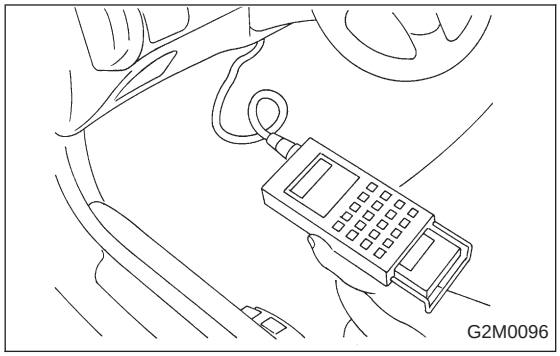
YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



9. Select Monitor Function Mode

Applicable cartridge of select monitor: No. 498345700

A: LIST OF FUNCTION MODE

1. F MODE (ROM ID, ANALOG DATA ARE DISPLAYED.)

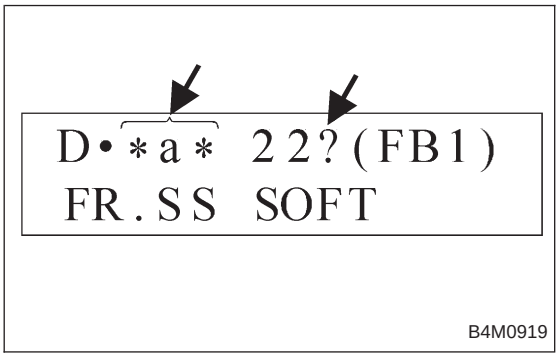
Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
F00	ROM ID	ECM identification	ROM ID number of ECM is read and enabled communication state is displayed.	Possible	4-4c [T9B0]
F01	FR	FR wheel speed (mile/h)	Wheel speed detected by the FR ABS sensor is displayed in mile/h.	Possible	4-4c [T9C0]
F02	FL	FL wheel speed (mile/h)	Wheel speed detected by the FL ABS sensor is displayed in mile/h.	Possible	4-4c [T9D0]
F03	RR	RR wheel speed (mile/h)	Wheel speed detected by the RR ABS sensor is displayed in mile/h.	Possible	4-4c [T9E0]
F04	RL	RL wheel speed (mile/h)	Wheel speed detected by the RL ABS sensor is displayed in mile/h.	Possible	4-4c [T9F0]
F05	FR	FR wheel speed (km/h)	Wheel speed detected by the FR ABS sensor is displayed in km/h.	Possible	4-4c [T9C0]
F06	FL	FL wheel speed (km/h)	Wheel speed detected by the FL ABS sensor is displayed in km/h.	Possible	4-4c [T9D0]
F07	RR	RR wheel speed (km/h)	Wheel speed detected by the RR ABS sensor is displayed in km/h.	Possible	4-4c [T9E0]
F08	RL	RL wheel speed (km/h)	Wheel speed detected by the RL ABS sensor is displayed in km/h.	Possible	4-4c [T9F0]
F09	BLS	Stop light switch monitor	Stop light switch monitor voltage is displayed.	Possible	4-4c [T9G0]
F10	G-SENS	G sensor output voltage (V)	Refers to vehicle acceleration detecting by the analog G sensor. It appears on the select monitor display in volts.	Possible	4-4c [T9H0]

2. FA MODE (ON/OFF DATA ARE DISPLAYED.)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FA0	B1	Stop light switch	LED 1 comes on with the switch on (with the brake pedal down).	Possible	4-4c [T9I0]
	VR	Valve relay signal	LED 2 comes on with the valve relay off.		
	MR	Motor relay signal	LED 3 comes on with the motor on.		
	AT	AT ABS signal	LED 4 comes on when ABS control is on.		
	AW	ABS warning light	LED 6 comes on when the warning light is on.		
	VM	Valve relay monitor	LED 1 comes on with the valve relay off.		
	MM	Motor relay monitor	LED 8 comes on when the motor relay is on.		
	CM	CCM signal	LED 9 comes on when ABS control is on.		

3. FB MODE (TROUBLE CODES ARE DISPLAYED.)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FB1	D·ALL	History of trouble codes is displayed.	A maximum of 3 trouble codes are displayed in order of occurrence.	Possible	4-4c [T10B0]
	D·NEW		The most recent trouble code appears on the select monitor display.		
	D·MID		The second most recent trouble code appears on the select monitor display.		
	D·OLD		The third most recent trouble code appears on the select monitor display.		



NOTE:
- If a particular trouble code is not properly stored in memory (due to a drop in ABSCM power supply, etc.) when a problem occurs, the trouble code, followed by a question mark "?", appears on the select monitor display. This shows it may be an unreliable reading.
- *a* refers to the troubles in order of occurrence (NEW. MID and OLD).

4. FC MODE (TROUBLE CODES AND FREEZE FRAME DATA ARE ERASED.)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FC0	D·CLR	History of trouble codes is erased.	Function of clearing trouble code.	Possible	4-4c [T9J0]

5. FD MODE (ABS SEQUENCE CHECK MODE)

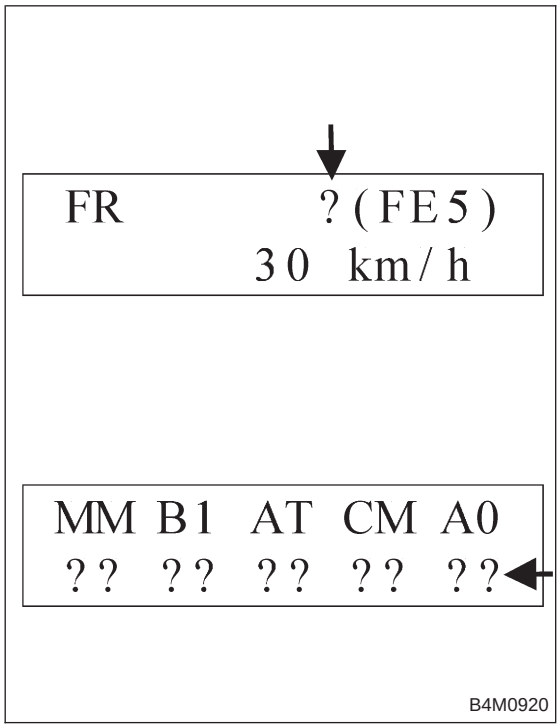
Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FD1	A·CHK	ABS sequence control	Perform ABS sequence control by operating valve and pump motor sequentially.	Impossible	4-4 [W20D0]

6. FE MODE (FREEZE FRAME DATA)

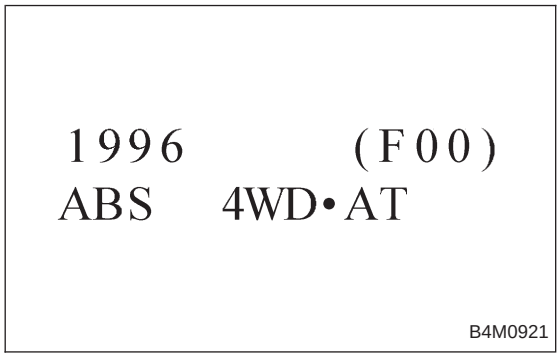
NOTE:
Data stored at the time of trouble occurrence is shown on display.

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FE1	FR	FR wheel speed (mile/h)	Wheel speed detected by the FR ABS sensor is displayed in mile/h.	Possible	4-4c [T9K0]
FE2	FL	FL wheel speed (mile/h)	Wheel speed detected by the FL ABS sensor is displayed in mile/h.	Possible	4-4c [T9L0]
FE3	RR	RR wheel speed (mile/h)	Wheel speed detected by the RR ABS sensor is displayed in mile/h.	Possible	4-4c [T9M0]
FE4	RL	RL wheel speed (mile/h)	Wheel speed detected by the RL ABS sensor is displayed in mile/h.	Possible	4-4c [T9N0]
FE5	FR	FR wheel speed (km/h)	Wheel speed detected by the FR ABS sensor is displayed in km/h.	Possible	4-4c [T9K0]
FE6	FL	FL wheel speed (km/h)	Wheel speed detected by the FL ABS sensor is displayed in km/h.	Possible	4-4c [T9L0]
FE7	RR	RR wheel speed (km/h)	Wheel speed detected by the RR ABS sensor is displayed in km/h.	Possible	4-4c [T9M0]
FE8	RL	RL wheel speed (km/h)	Wheel speed detected by the RL ABS sensor is displayed in km/h.	Possible	4-4c [T9N0]
FE13	POWER	ABSCM power supply voltage (V)	Power (in volts) supplied to ABSCM appears on the select monitor display.	Possible	4-4c [T9O0]
FE14	G-SENS	G sensor output voltage (V)	Refers to vehicle acceleration detected by the analog G sensor. It appears on the select monitor display in volts.	Possible	4-4c [T9P0]
FE15	MM	Motor relay monitor	LED 1 comes on when motor relay is on.	Possible	4-4c [T9Q0]
	B1	Stop light switch	LED 2 comes on with the stop light switch on (with the brake pedal depressed).		
	AT	AT ABS signal	LED 3 comes on when ABS control is on.		
	CM	CCM signal	LED 4 comes on when ABS control is on.		
	A0	ABS control	LED 5 comes on when ABS control is on.		

1) When a trouble code is not stored in memory, activating the FE mode causes the initial value to appear on the select monitor display.
- FE1 — 4: 159 mile/h
- FE5 — 8: 255 km/h
- FE13: 16.84 V
- FE14: 5.00 V
- FE15: The MM, B1 and A0 LEDs are on. The AT and CM LEDs are out.



2) If freeze frame data is not properly stored in memory (due to a drop in ABSCM power supply, etc.), a trouble code, preceded by a question mark "?", appears on the select monitor display. This shows it may be an unreliable reading.
3) When a trouble code is detected in the FE mode, a question mark "?" appears continuously on the select monitor display until the freeze frame data is stored in memory.



B: MODE F00 — ROM ID NUMBER (ROM) —

CONDITION:

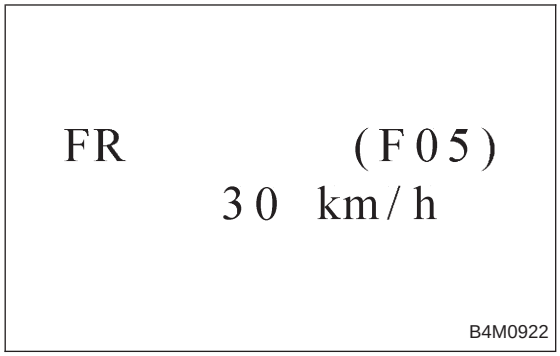
Ignition switch ON

SPECIFIED DATA:

Presentation display

- Probable cause (Item outside "specified data")

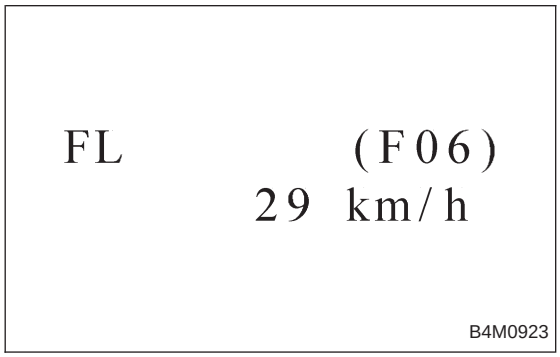
1. Error 1	Check for loose or disconnected connector, and discontinued circuit, etc.
2. Error 2	Check for poor contact of cartridge, or different type cartridge.



C: MODE F01 AND F05 — FRONT RIGHT WHEEL SPEED SIGNAL (FR) —

- Compare speedometer with monitor indications.
- F01: FR wheel speed is indicated in mile per hour (mile/h).
- F05: FR wheel speed is indicated in kilometer per hour (km/h).

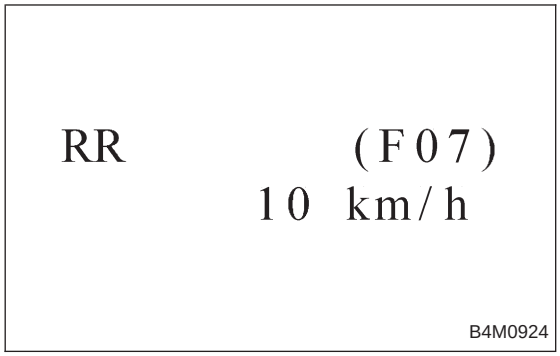
NOTE:
The monitor as shown, indicates that FR wheel speed is 30 km/h.



D: MODE F02 AND F06 — FRONT LEFT WHEEL SPEED SIGNAL (FL) —

- Compare speedometer with monitor indications.
- F02: FL wheel speed is indicated in mile per hour (mile/h).
- F06: FL wheel speed is indicated in kilometer per hour (km/h).

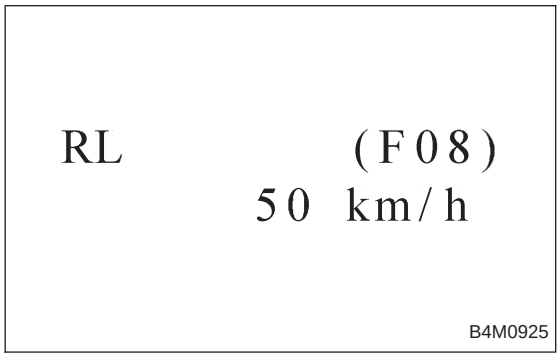
NOTE:
The monitor as shown, indicates that FL wheel speed is 29 km/h.



E: MODE F03 AND F07 — REAR RIGHT WHEEL SPEED SIGNAL (RR) —

- Compare speedometer with monitor indications.
- F03: RR wheel speed is indicated in mile per hour (mile/h).
- F07: RR wheel speed is indicated in kilometer per hour (km/h).

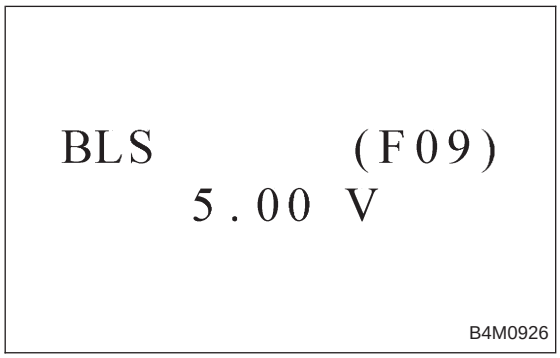
NOTE:
The monitor as shown, indicates that RR wheel speed is 10 km/h.



F: MODE F04 AND F08 — REAR LEFT WHEEL SPEED SIGNAL (RL) —

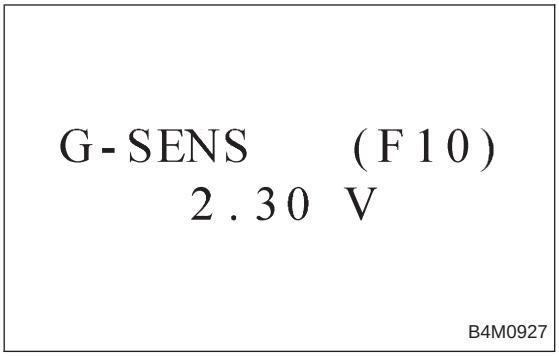
- Compare speedometer with monitor indications.
- F04: RL wheel speed is indicated in mile per hour (mile/h).
- F08: RL wheel speed is indicated in kilometer per hour (km/h).

NOTE:
The monitor as shown, indicates that RL wheel speed is 50 km/h.

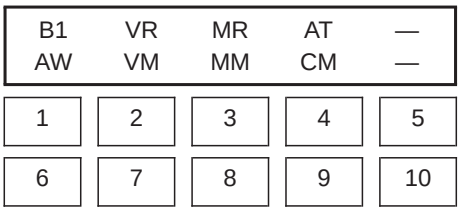


G: MODE F09 — STOP LIGHT SWITCH MONITOR (BLS) —

- Stop light switch monitor voltage is displayed.



LED No.	Signal name	Display
1	Stop light switch	B1
2	Valve relay signal	VR
3	Motor relay signal	MR
4	AT ABS signal	AT
5	—	—
6	ABS warning light	AW
7	Valve relay monitor	VM
8	Motor relay monitor	MM
9	CCM signal	CM
10	—	—



H: MODE F10 — G SENSOR OUTPUT VOLTAGE (G-SENS) —

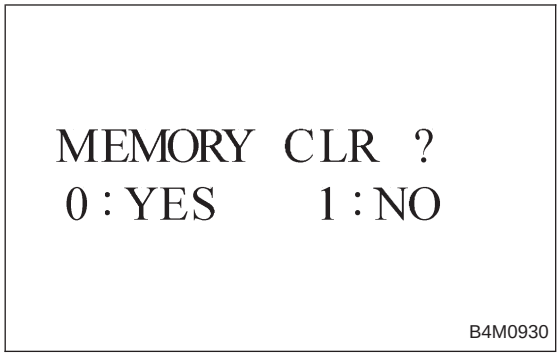
● Refers to vehicle acceleration detecting by the analog G sensor. It appears on the select monitor display in volts.

NOTE:
Only AWD model

I: MODE FA0 — ON ↔ OFF SIGNAL —

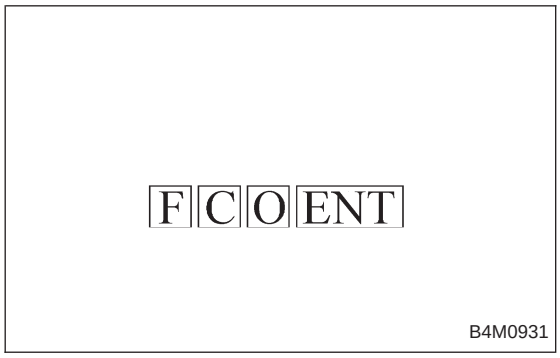
Requirement for LED “ON”

LED No. 1 Stop light switch is turned ON. (With brake pedal depressed.)
LED No. 2 Valve relay is turned OFF.
LED No. 3 Motor relay is turned ON.
LED No. 4 ABS control operates.
LED No. 6 ABS warning light is ON.
LED No. 7 Valve relay is turned OFF.
LED No. 8 Motor relay is turned ON.
LED No. 9 ABS control operates.

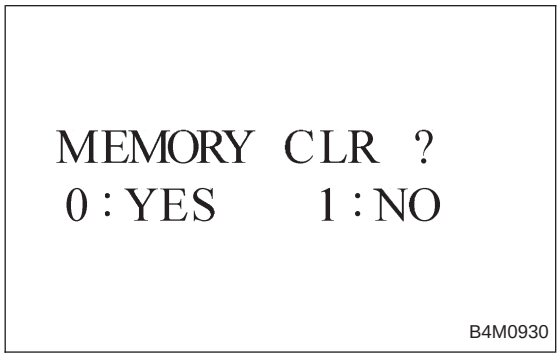


J: MODE FC0 — HISTORY OF TROUBLE CODES IS ERASED (D·CLR) —

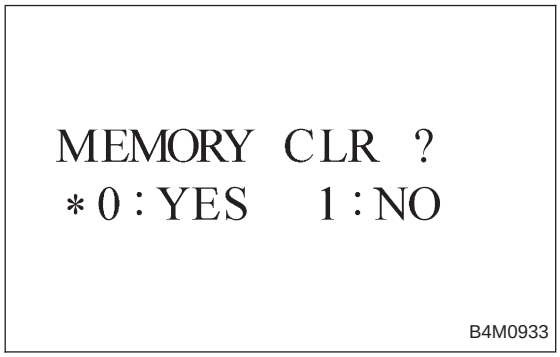
● Deletes the recorded trouble codes in ABS control module.



1) Use function keys to put in F C O ENT.

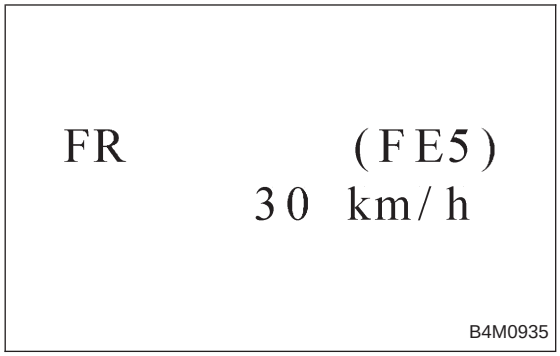


2) System indicates as shown.



3) Key in 0, to clear memories. The indication of * is added to screen.

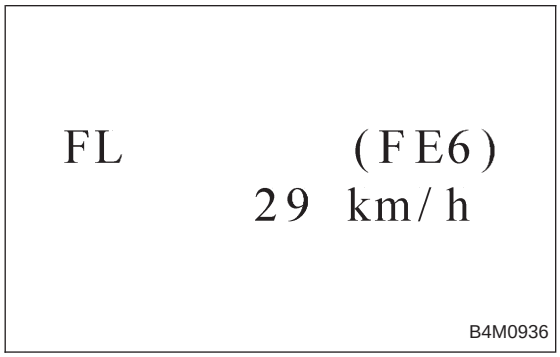
4) Key in ENT. System indicates as shown.
5) Turn the key OFF.



K: MODE FE1 AND FE5 — FRONT RIGHT WHEEL SPEED SIGNAL (FR) —

- The wheel speed is indicated at the time of malfunction.
- FE1: FR wheel speed is indicated in mile per hour (mile/h).
- FE5: FR wheel speed is indicated in kilometer per hour (km/h).

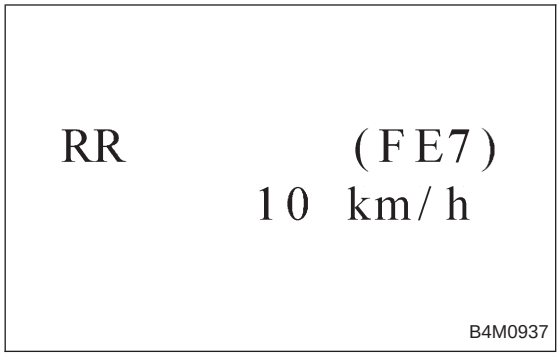
NOTE:
The monitor as shown, indicates that FR wheel speed is 30 km/h.



L: MODE FE2 AND FE6 — FRONT LEFT WHEEL SPEED SIGNAL (FL) —

- The wheel speed is indicated at the time of malfunction.
- FE2: FL wheel speed is indicated in mile per hour (mile/h).
- FE6: FL wheel speed is indicated in kilometer per hour (km/h).

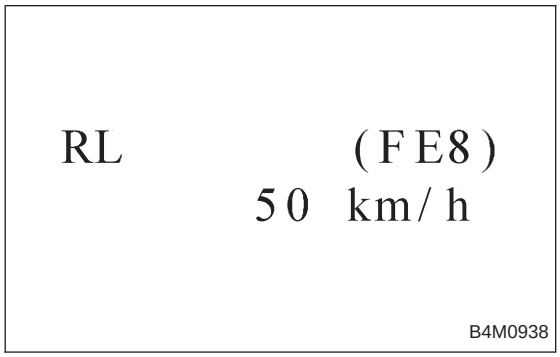
NOTE:
The monitor as shown, indicates that FL wheel speed is 29 km/h.



M: MODE FE3 AND FE7 — REAR RIGHT WHEEL SPEED SIGNAL (RR) —

- The wheel speed is indicated at the time of malfunction.
- FE3: RR wheel speed is indicated in mile per hour (mile/h).
- FE7: RR wheel speed is indicated in kilometer per hour (km/h).

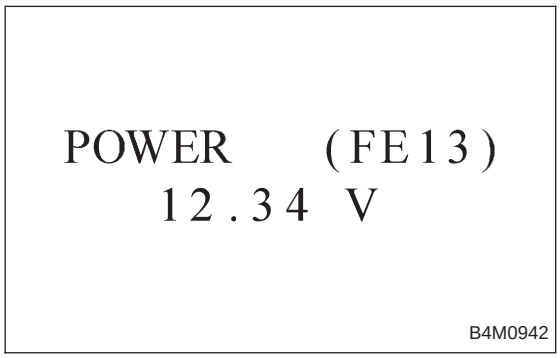
NOTE:
The monitor as shown, indicates that RR wheel speed is 10 km/h.



N: MODE FE4 AND FE8 — REAR LEFT WHEEL SPEED SIGNAL (RL) —

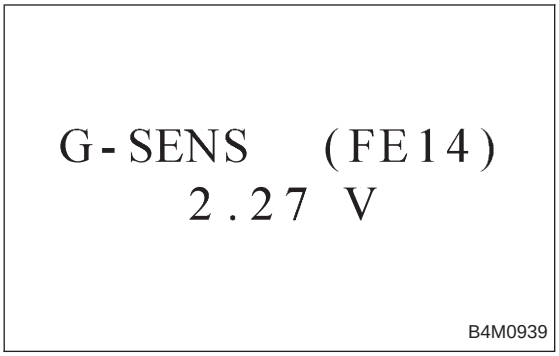
- The wheel speed is indicated at the time of malfunction.
- FE4: RL wheel speed is indicated in mile per hour (mile/h).
- FE8: RL wheel speed is indicated in kilometer per hour (km/h).

NOTE:
The monitor as shown, indicates that RL wheel speed is 50 km/h.

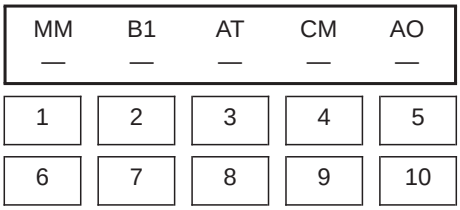


O: MODE FE13 — ABSCM POWER SUPPLY VOLTAGE (POWER) —

- ABSCM power supply voltage is indicated at the time of malfunction.



LED No.	Signal name	Display
1	Motor relay monitor	MM
2	Stop light switch	B1
3	AT ABS signal	AT
4	CCM signal	CM
5	ABS signal	AO
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—



P: MODE FE14 — G SENSOR OUTPUT VOLTAGE (G-SENS) —

● Refers to vehicle acceleration detected by the analog G sensor at the time of malfunction. It appears on the select monitor display in volts.

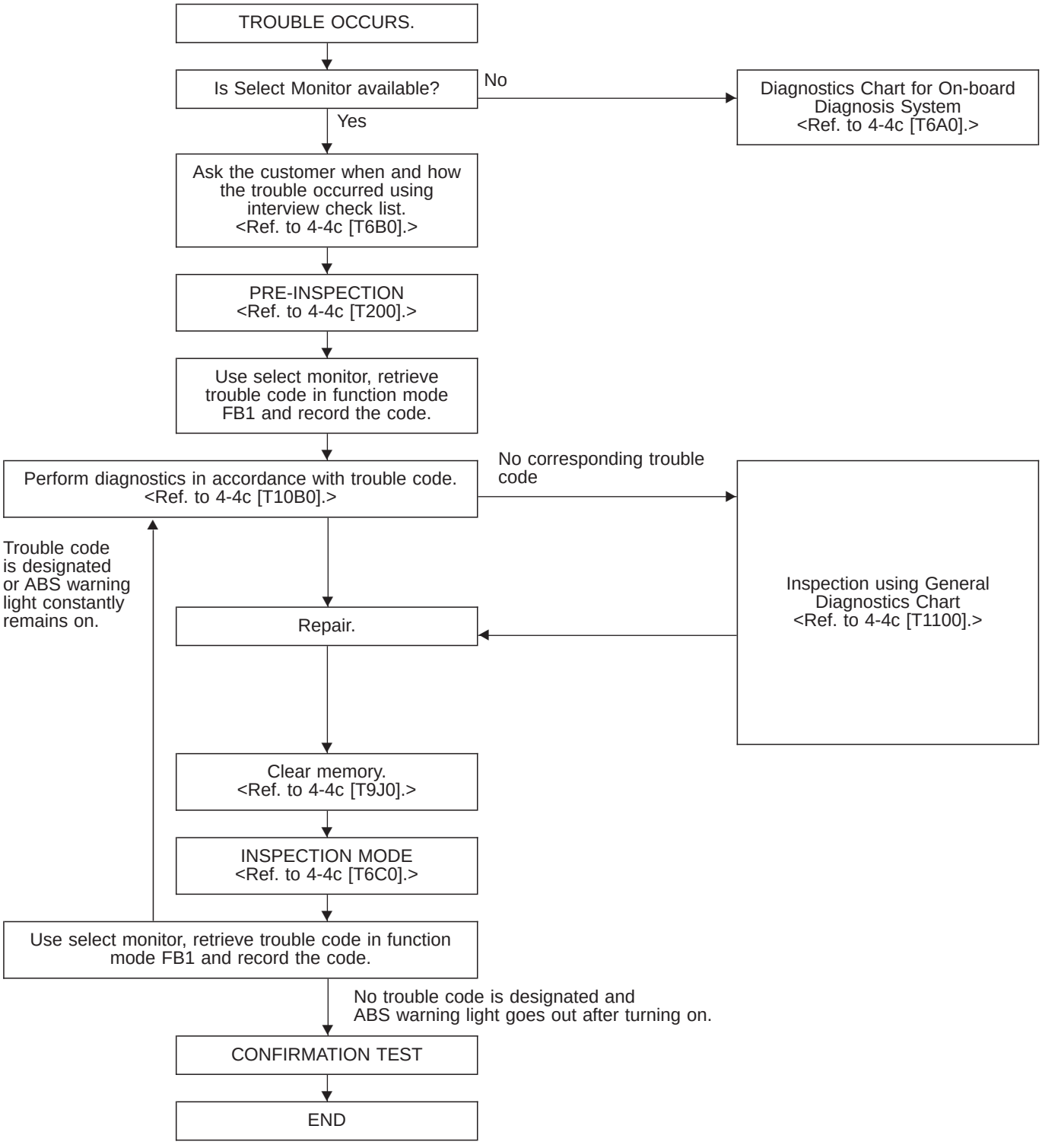
NOTE:
Only AWD model

Q: MODE FE15 — ON ↔ OFF SIGNAL —

● ON or OFF is indicated at the time of malfunction.
● Requirement for LED “ON”
LED No. 1 Motor relay is turned ON.
LED No. 2 Stop light switch is turned ON. (With brake pedal depressed.)
LED No. 3 ABS control operates.
LED No. 4 ABS control operates.
LED No. 5 ABS control operates.

10. Diagnostics Chart with Select Monitor

A: BASIC DIAGNOSTIC CHART



NOTE:
To check harness for broken wires or short circuits, shake it while holding it or the connector.

B: LIST OF TROUBLE CODE

Code	Display screen (FB1)	Contents of diagnosis	Ref. to
—	ERROR 3 (1)	Select monitor communication failure	4-4c [T10C0]
11	NO TROUBLE	Although no trouble appears on the select monitor display, the ABS warning light remains on.	4-4c [T10D0]
21	FR. SS HARD	Open circuit or input voltage too high of FR sensor	4-4c [T10E0]
22	FR. SS SOFT	Abnormal ABS sensor signal of FR sensor	4-4c [T10I0]
23	FL. SS HARD	Open circuit or input voltage too high of FL sensor	4-4c [T10F0]
24	FL. SS SOFT	Abnormal ABS sensor signal of FL sensor	4-4c [T10J0]
25	RR. SS HARD	Open circuit or input voltage too high of RR sensor	4-4c [T10G0]
26	RR. SS SOFT	Abnormal ABS sensor signal of RR sensor	4-4c [T10K0]
27	RL. SS HARD	Open circuit or input voltage too high of RL sensor	4-4c [T10H0]
28	RL. SS SOFT	Abnormal ABS sensor signal of RL sensor	4-4c [T10L0]
29	EITHER. SS SOFT	Abnormal ABS sensor signal (any one of four)	4-4c [T10M0]
31	FR. EV VALVE	Abnormal FR inlet valve	4-4c [T10N0]
32	FR. AV VALVE	Abnormal FR outlet valve	4-4c [T10R0]
33	FL. EV VALVE	Abnormal FL inlet valve	4-4c [T10O0]
34	FL. AV VALVE	Abnormal FL outlet valve	4-4c [T10S0]
35	RR. EV VALVE	Abnormal RR inlet valve	4-4c [T10P0]
36	RR. AV VALVE	Abnormal RR outlet valve	4-4c [T10T0]
37	RL. EV VALVE	Abnormal RL inlet valve	4-4c [T10Q0]
38	RL. AV VALVE	Abnormal RL outlet valve	4-4c [T10U0]
41	ECU	Abnormal ABSCM	4-4c [T10V0]
42	LOW VOLTAGE	Source voltage is low.	4-4c [T10W0]
44	CCM LINE	A combination of AT control abnormals (ABS not in control)	4-4c [T10X0]
	CCM OPEN	A combination of AT control abnormals (ABS in control)	4-4c [T10Y0]
46	GS POWER OVER	G sensor line voltage too high	4-4c [T10Z0]
	GS POWER LOW	G sensor line voltage too low	4-4c [T10AA0]
51	V. RELAY	Abnormal valve relay	4-4c [T10AB0]
	V. RELAY ON	Valve relay ON failure	4-4c [T10AC0]
52	M. RELAY OPEN	Open circuit of motor relay	4-4c [T10AD0]
	M. RELAY ON	Motor relay ON failure	4-4c [T10AE0]
	MOTOR	Abnormal motor	4-4c [T10AF0]
54	BLS	Abnormal stop light switch	4-4c [T10AG0]
56	G SENSOR LINE	Open or short circuit of G sensor	4-4c [T10AH0]
	G SENSOR +B	Battery short of G sensor	4-4c [T10AI0]
	G SENSOR Hμ	Abnormal G sensor high μ output	4-4c [T10AJ0]
	G SENSOR STICK	G sensor output is stuck.	4-4c [T10AK0]

NOTE:
High μ means high friction coefficient against road surface.

C: ERROR 3 (1) — SELECT MONITOR COMMUNICATION FAILURE —

DIAGNOSIS:

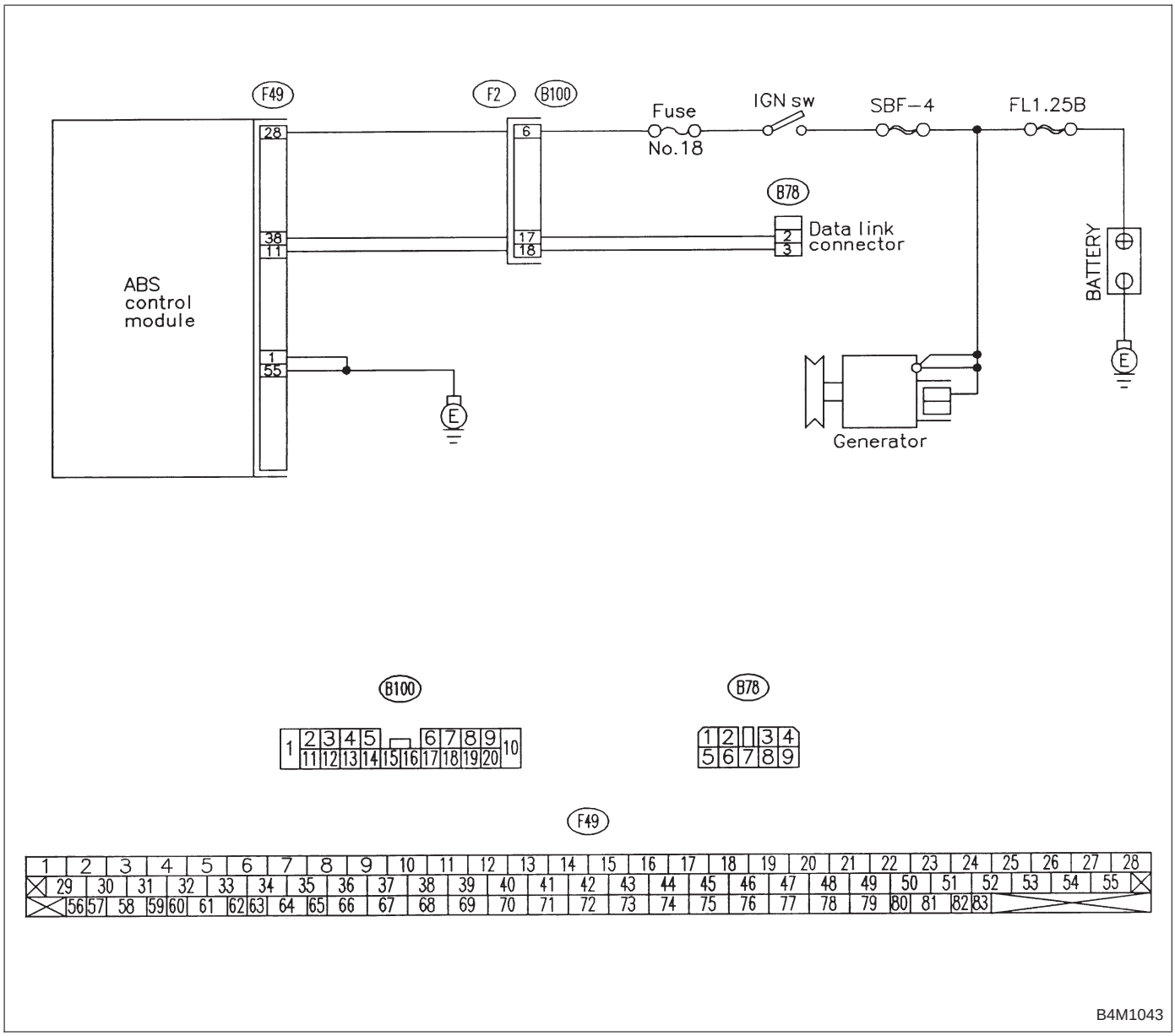
- Faulty harness connector

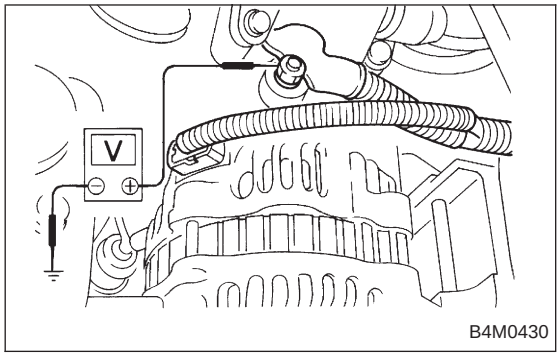
TROUBLE SYMPTOM:

- ABS warning light remains on.
- ERROR 3 or 1 appears on the select monitor display.

10C1.	**Check generator.**
10C2.	**Check battery terminal.**
10C3.	**Check communication of select monitor.**
10C4.	**Check installation of ABSCM connector.**
10C5.	**Check power supply of ABSCM.**
10C6.	**Check ground circuit of ABSCM.**
10C7.	**Check harness connector between ABSCM and data link connector.**
10C8.	**Check poor contact in connector between ABSCM and data link connector.**

WIRING DIAGRAM:





10C1	CHECK GENERATOR.

1) Start the engine.
2) Idle the engine.
3) Measure voltage between generator and chassis ground.

CHECK : ***Terminal***
Generator B terminal (+) — Chassis ground (−):
Is voltage 10 — 15 V?

YES : Go to step **10C2.**
NO : Repair generator.

10C2	CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

CHECK : ***Is there poor contact at battery terminal?***
YES : Repair battery terminal.
NO : Go to step **10C3.**

10C3	CHECK COMMUNICATION OF SELECT MONITOR.

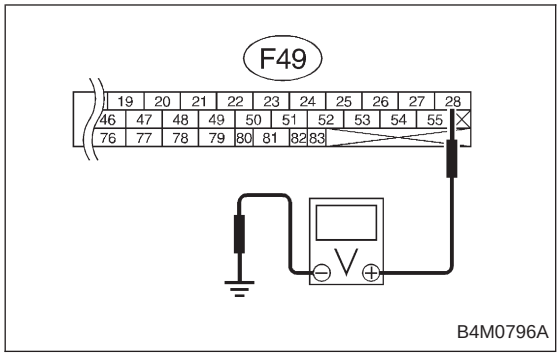
Using the select monitor, check whether communication to other system (such as engine, AT, etc.) can be executed normally.

CHECK : ***Are the name and year of the system displayed on the select monitor?***
YES : Go to step **10C4.**
NO : Repair select monitor communication cable and connector.

10C4	CHECK INSTALLATION OF ABSCM CONNECTOR.

Turn ignition switch to OFF.

CHECK : ***Is ABSCM connector inserted into ABSCM until the clamp locks onto it?***
YES : Go to step **10C5.**
NO : Insert ABSCM connector into ABSCM until the clamp locks onto it.



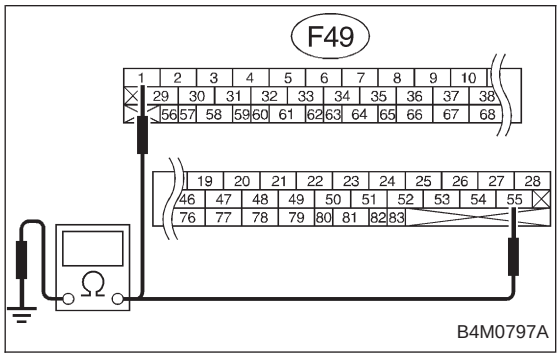
10C5	CHECK POWER SUPPLY OF ABSCM.

1) Disconnect connector from ABSCM.
2) Start engine.
3) Idle the engine.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 28 (+) — Chassis ground (−):
Is voltage 10 — 15 V?

YES : Go to step **10C6.**

NO : Repair ABSCM power supply circuit.



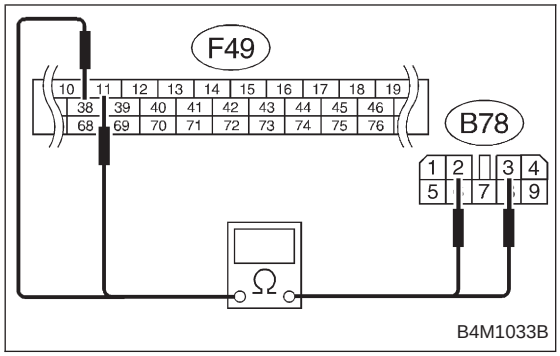
10C6	CHECK GROUND CIRCUIT OF ABSCM.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 1 — Chassis ground:
(F49) No. 55 — Chassis ground:
Is resistance less than 0.5 Ω?

YES : Repair harness/connector between ABSCM and select monitor.

NO : Go to step **10C7.**



10C7	**CHECK HARNESS CONNECTOR BETWEEN ABSCM AND DATA LINK CONNECTOR.**

1) Turn ignition switch OFF.
2) Measure resistance between ABSCM connector and data link connector.

CHECK ***: Connector & terminal***
(F49) No. 11 — (B78) No. 3
(F49) No. 38 — (B78) No. 2
Is resistance less than 0.5 Ω?

YES : Repair harness and connector between ABSCM and data link connector.

NO : Go to step **10C8.**

10C8	**CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND DATA LINK CONNECTOR.**

CHECK ***: Is there poor contact in connectors between ABSCM and data link connector?***

YES : Repair connector.

NO : Replace ABSCM.

D: NO TROUBLE
— ALTHOUGH NO TROUBLE APPEARS ON THE SELECT MONITOR DISPLAY, THE ABS WARNING LIGHT REMAINS ON. —

DIAGNOSIS:

- ABS warning light circuit is shorted.

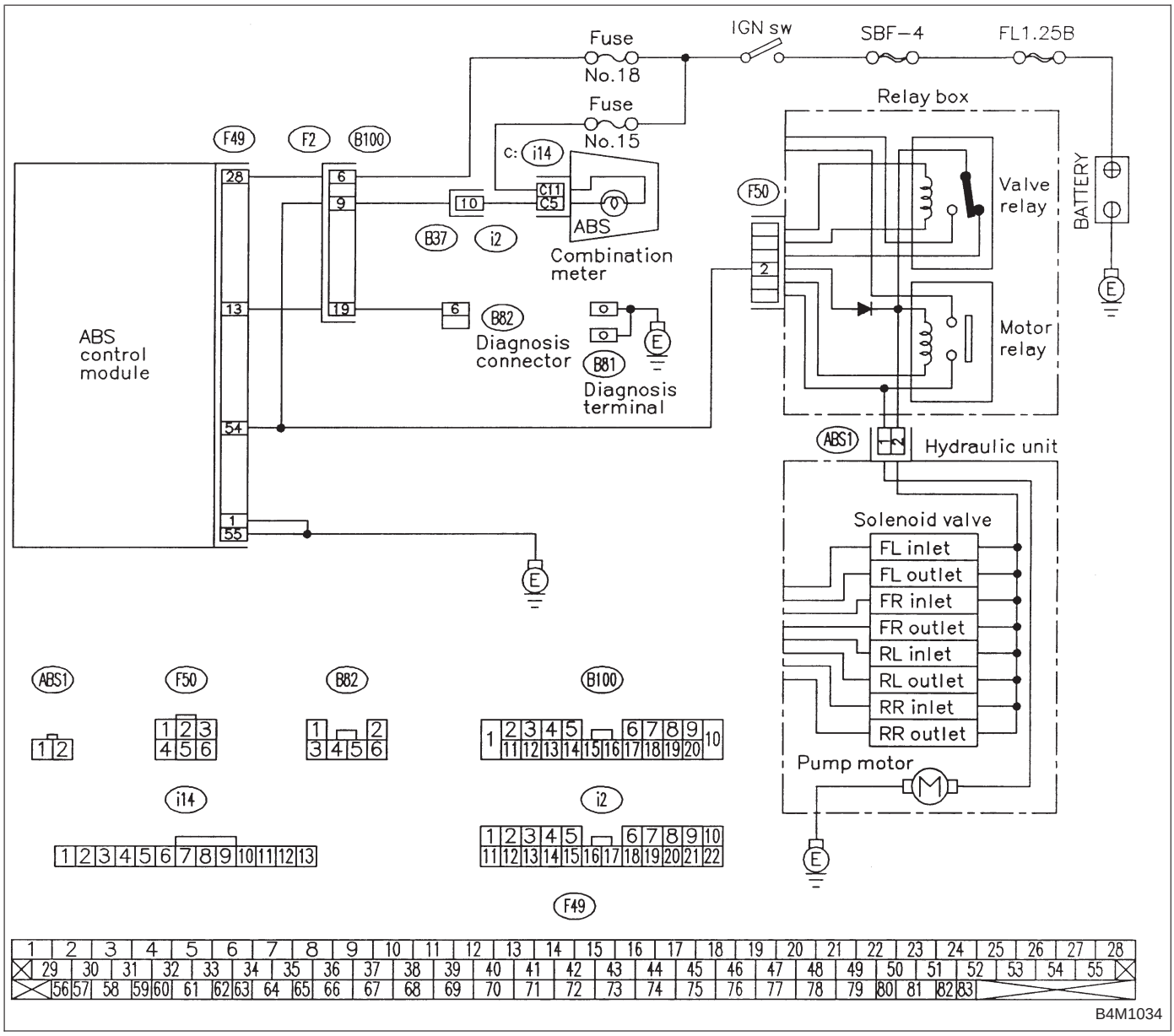
TROUBLE SYMPTOM:

- ABS warning light remains on.
- NO TROUBLE displayed on the select monitor.

NOTE:
When the ABS warning light is OFF and “NO TROUBLE” is displayed on the select monitor, the system is in normal condition.

10D1.	**Check ground short of harness.**
↓	
10D2.	**Check ground short of relay box.**

WIRING DIAGRAM:



10D1	CHECK GROUND SHORT OF HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM.
3) Disconnect connector (F50) from relay box.
4) Turn ignition switch to ON.

CHECK ***: Does the ABS warning light remain OFF?***

YES : Go to step **10D2.**

NO : Repair harness between ABSCM, relay box ABS warning light.

10D2	CHECK GROUND SHORT OF RELAY BOX.

1) Turn ignition switch to OFF.
2) Connect connector (F50) to relay box.
3) Disconnect connector (ABS1) from hydraulic unit.
4) Remove valve relay from relay box.
5) Turn ignition switch to ON.

CHECK ***: Does the ABS warning light remain OFF?***

YES : Replace ABSCM.

NO : Replace relay box.

E: 21 FR. SS HARD
— ABNORMAL FRONT RH ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —

F: 23 FL. SS HARD
— ABNORMAL FRONT LH ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —

G: 25 RR. SS HARD
— ABNORMAL REAR RH ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —

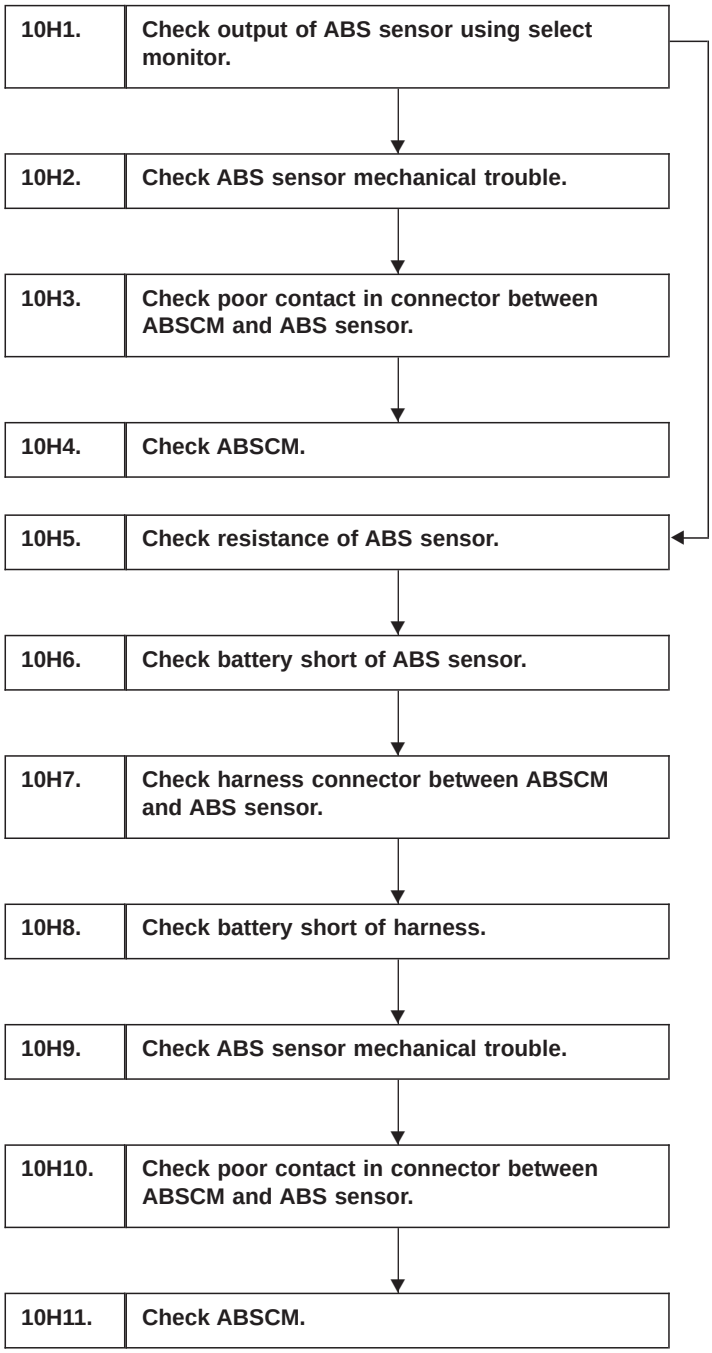
H: 27 RL. SS HARD
— ABNORMAL REAR LH ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —

DIAGNOSIS:

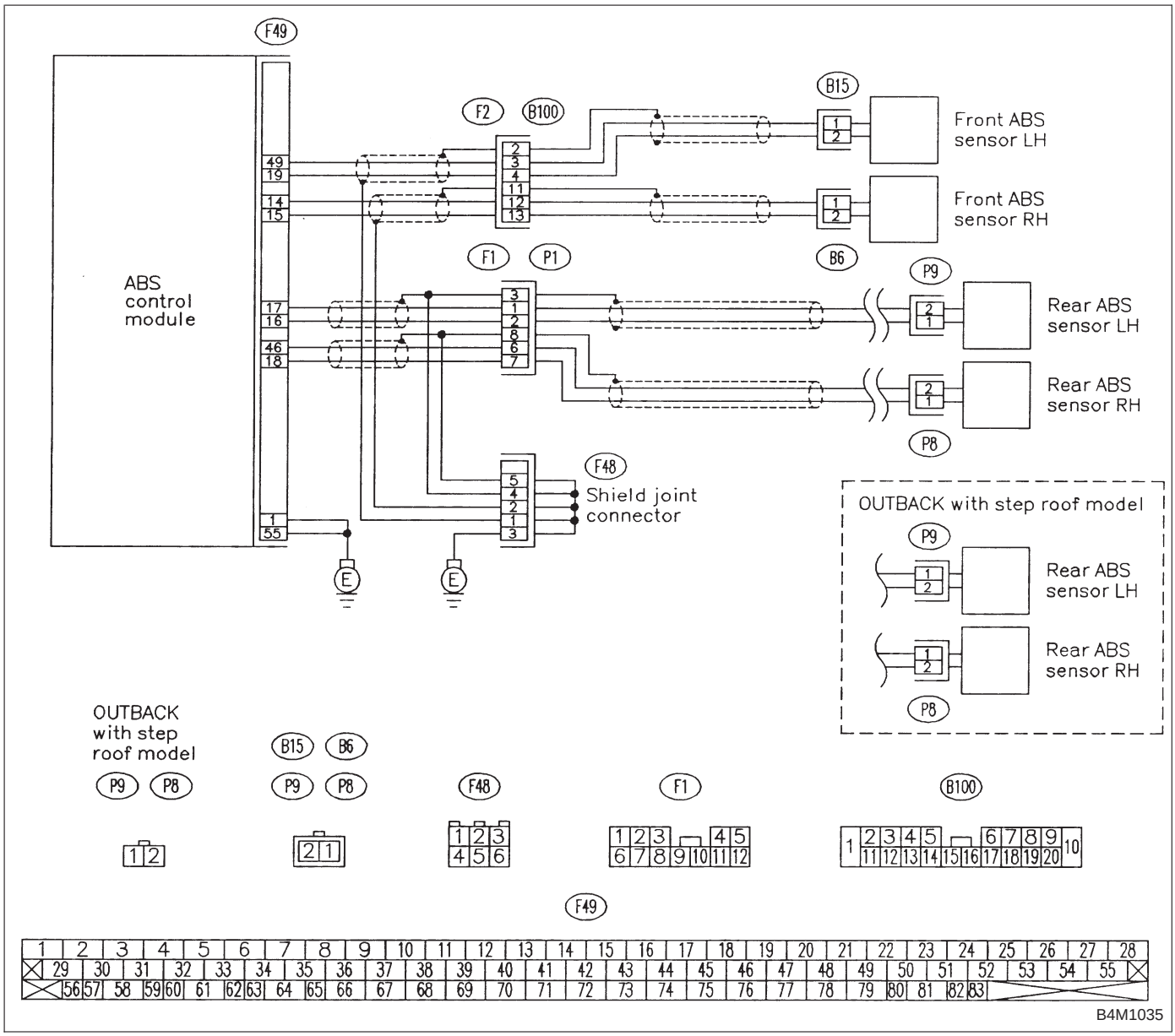
- Faulty ABS sensor (Broken wire, input voltage too high)
- Faulty harness connector

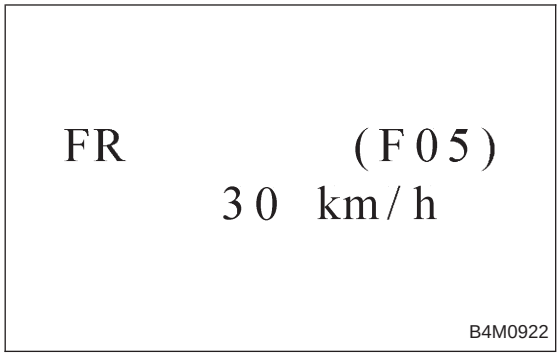
TROUBLE SYMPTOM:

- ABS does not operate.



WIRING DIAGRAM:





10H1	CHECK OUTPUT OF ABS SENSOR USING SELECT MONITOR.

Read the ABS sensor output corresponding to the faulty system in the select monitor function mode.

NOTE:
The select monitor display shows that the front right wheel is rotating at 30 km/h.

CHECK ***: Does the speed indicated on the display change in response to the speedometer reading during acceleration/deceleration when the steering wheel is in the straight-ahead position?***

YES : Go to step **10H2.**

NO : Go to step **10H5.**

10H2	CHECK ABS SENSOR MECHANICAL TROUBLE.

CHECK ***: Tightening torque:***
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)
Are the ABS sensor installation bolts tightened securely?

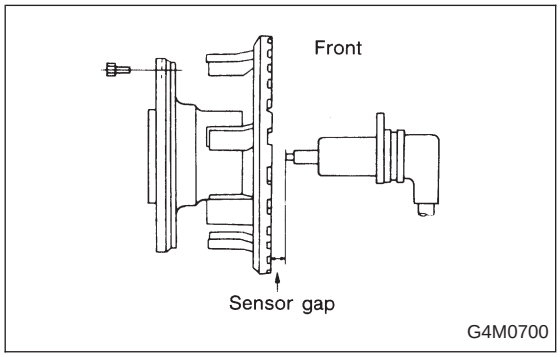
YES : Go to next CHECK .

NO : Tighten ABS sensor installation bolts securely.

CHECK ***: Tightening torque:***
13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)
Are the tone wheel installation bolts tightened securely?

YES : Go to next step.

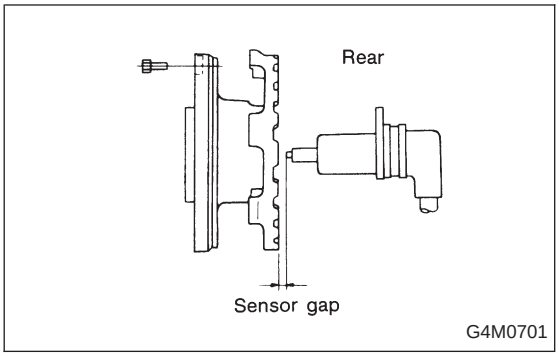
NO : Tighten tone wheel installation bolts securely.



1) Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.

CHECK ***: Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)



YES : Go to next step.
NO : Adjust the gap.

NOTE:
Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

2) Measure hub runout.

CHECK ***: Is the runout less than 0.05 mm (0.0020 in)?***
YES : Go to step **10H3.**
NO : Repair hub.

10H3	**CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND ABS SENSOR.**

CHECK ***: Is there poor contact in connectors between ABSCM and ABS sensor?***
YES : Repair connector.
NO : Go to step **10H4.**

10H4	**CHECK ABSCM.**

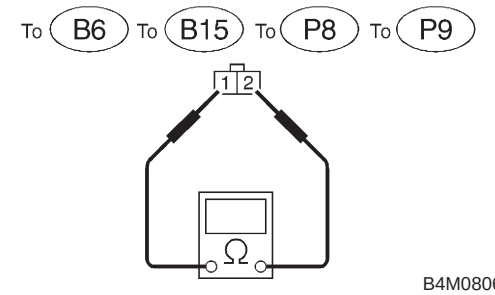
1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***
YES : Replace ABSCM.
NO : Go to next CHECK .

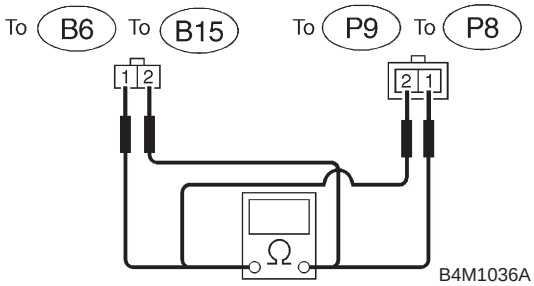
CHECK ***: Are other trouble codes being output?***
YES : Proceed with the diagnosis corresponding to the trouble code.
NO : A temporary poor contact.

NOTE:
Check harness and connectors between ABSCM and ABS sensor.

Except OUTBACK with step roof model



OUTBACK with step roof model



10H5	CHECK RESISTANCE OF ABS SENSOR.

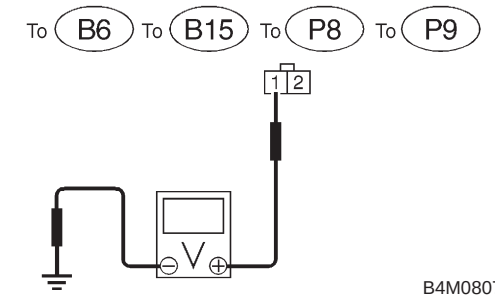
1) Turn ignition switch to OFF.
2) Disconnect connector from ABS sensor.
3) Measure resistance of ABS sensor connector terminals.

CHECK ***: Trouble code/Connector & terminal***
21/to (B6) No. 1 — No. 2
23/to (B15) No. 1 — No. 2
25/to (P8) No. 1 — No. 2
27/to (P9) No. 1 — No. 2
Is resistance 0.8 — 1.2 kΩ?

YES : Go to step **10H6.**

NO : Replace ABS sensor.

Except OUTBACK with step roof model



10H6	CHECK BATTERY SHORT OF ABS SENSOR.

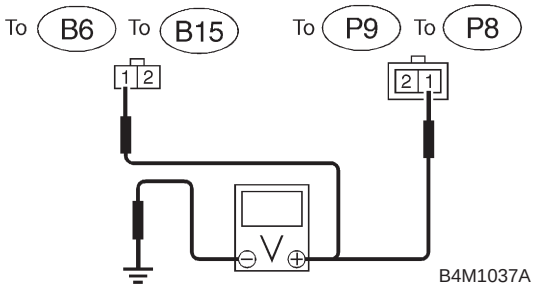
1) Disconnect connector from ABSCM.
2) Turn ignition switch to ON.
3) Measure voltage between ABS sensor and chassis ground.

CHECK ***: Trouble code/Connector & terminal***
21/to (B6) No. 1 (+) — Chassis ground (−)
23/to (B15) No. 1 (+) — Chassis ground (−)
25/to (P8) No. 1 (+) — Chassis ground (−)
27/to (P9) No. 1 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

NO : Replace ABS sensor.

OUTBACK with step roof model

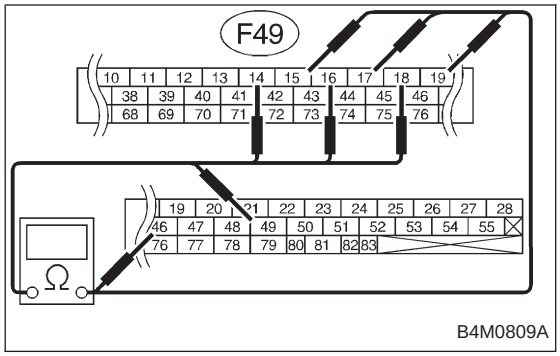


4) Turn ignition switch to OFF.
5) Measure voltage between ABS sensor and chassis ground.

CHECK ***: Trouble code/Connector & terminal***
21/to (B6) No. 1 (+) — Chassis ground (−)
23/to (B15) No. 1 (+) — Chassis ground (−)
25/to (P8) No. 1 (+) — Chassis ground (−)
27/to (P9) No. 1 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10H7.**

NO : Replace ABS sensor.



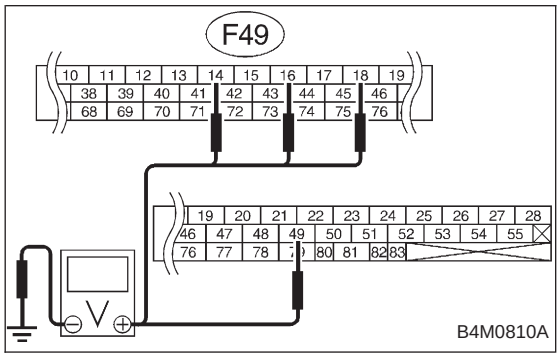
10H7	CHECK HARNESS CONNECTOR BETWEEN ABSCM AND ABS SENSOR.

1) Connect connector to ABS sensor.
2) Measure resistance between ABSCM connector terminals.

CHECK : ***Trouble code/Connector & terminal***
21/(F49) No. 14 — No. 15
23/(F49) No. 49 — No. 19
25/(F49) No. 18 — No. 46
27/(F49) No. 16 — No. 17
Is resistance 0.8 — 1.2 kΩ?

YES : Go to step **10H8.**

NO : Repair harness connector between ABSCM and ABS sensor.



10H8	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
21/(F49) No. 14 — Chassis ground
23/(F49) No. 49 — Chassis ground
25/(F49) No. 18 — Chassis ground
27/(F49) No. 16 — Chassis ground
Is voltage 0 V?

YES : Go to next step.

NO : Repair harness between ABSCM and ABS sensor.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
21/(F49) No. 14 — Chassis ground
23/(F49) No. 49 — Chassis ground
25/(F49) No. 18 — Chassis ground
27/(F49) No. 16 — Chassis ground
Is voltage 0 V?

YES : Go to step **10H9.**

NO : Repair harness between ABSCM and ABS sensor.

10H9	CHECK ABS SENSOR MECHANICAL TROUBLE.

CHECK : ***Tightening torque:***
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)
Are the ABS sensor installation bolts tightened securely?

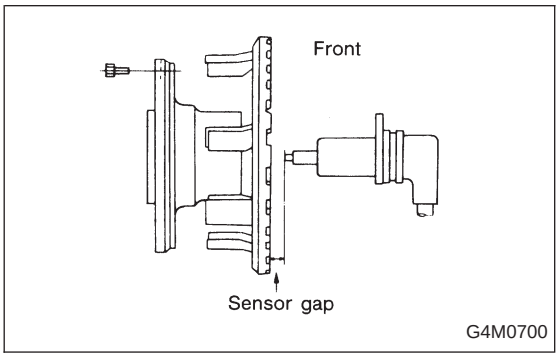
YES : Go to next CHECK .

NO : Tighten ABS sensor installation bolts securely.

CHECK : ***Tightening torque:***
13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)
Are the tone wheel installation bolts tightened securely?

YES : Go to next step.

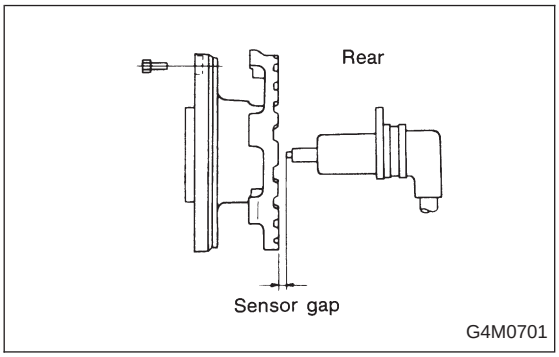
NO : Tighten tone wheel installation bolts securely.



1) Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.

CHECK : ***Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)



YES : Go to next step.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

2) Measure hub runout.

CHECK : ***Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **10H10.**

NO : Repair hub.

10H10	**CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND ABS SENSOR.**

CHECK ***: Is there poor contact in connectors between ABSCM and ABS sensor?***

YES : Repair connector.

NO : Go to step **10H11.**

10H11	**CHECK ABSCM.**

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

NOTE:
Check harness and connectors between ABSCM and ABS sensor.

I: 22 FR. SS SOFT
— ABNORMAL FRONT RH ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —

J: 24 FL. SS SOFT
— ABNORMAL FRONT LH ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —

K: 26 RR. SS SOFT
— ABNORMAL REAR RH ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —

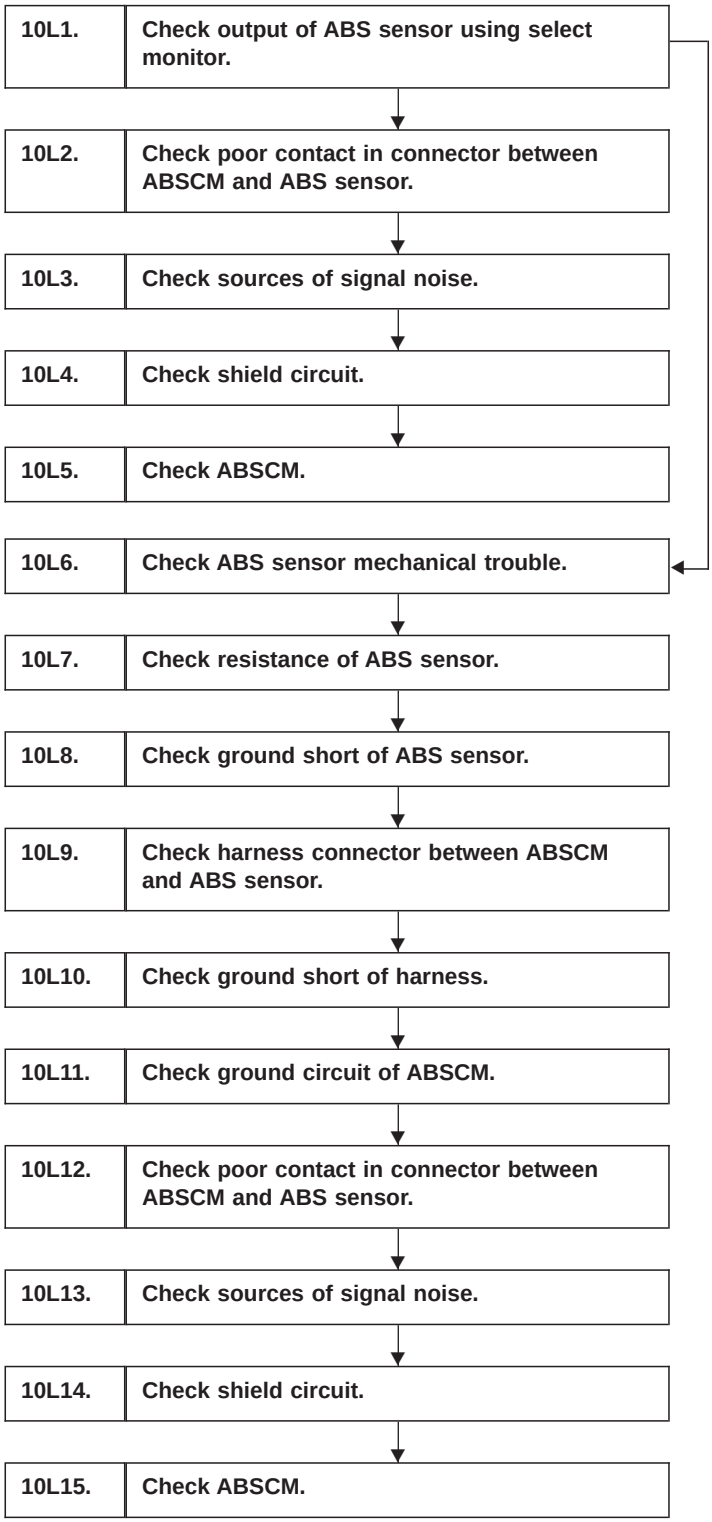
L: 28 RL. SS SOFT
— ABNORMAL REAR LH ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —

DIAGNOSIS:

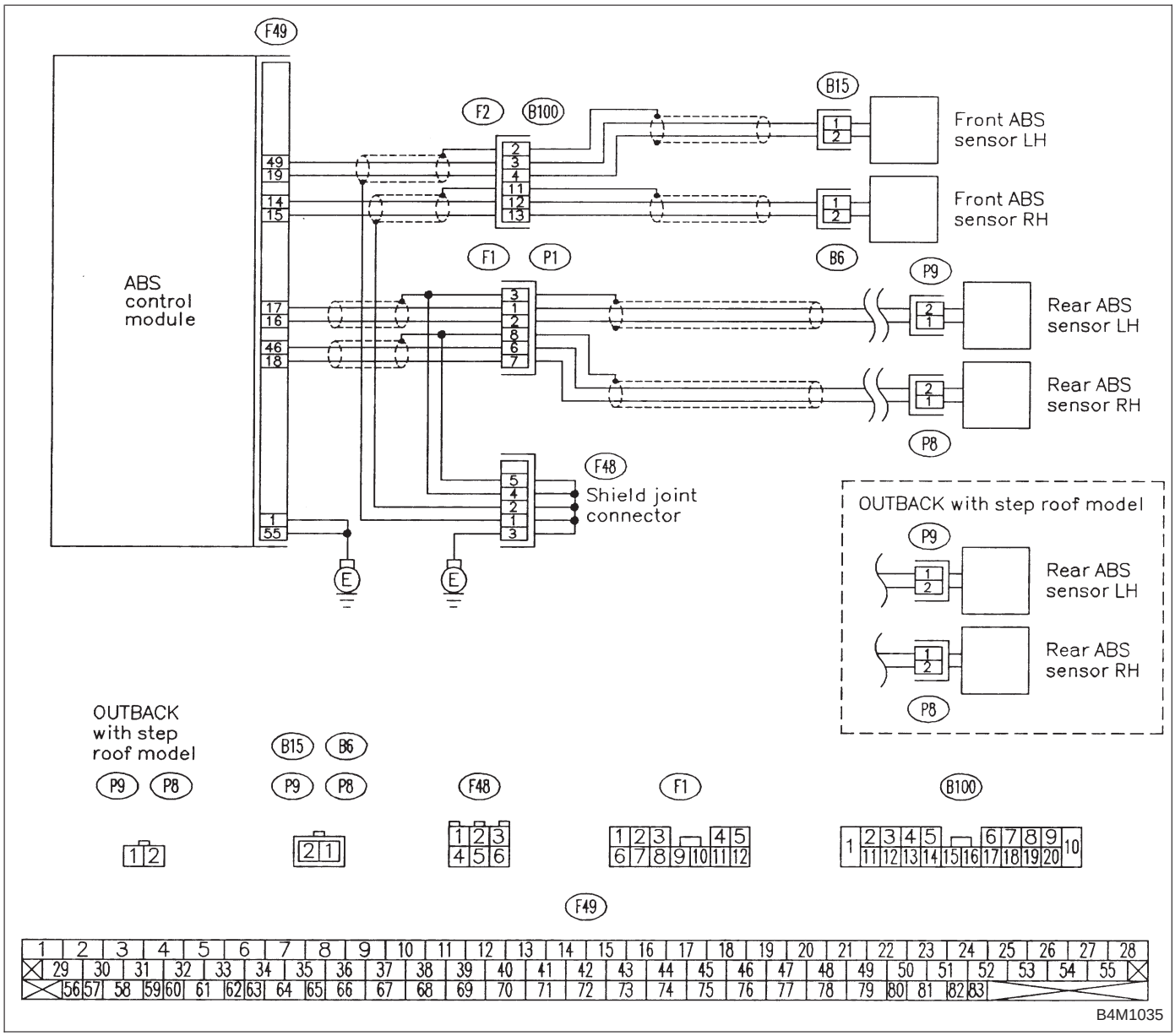
- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector

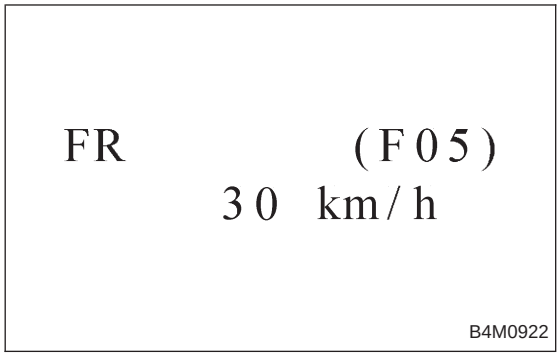
TROUBLE SYMPTOM:

- ABS does not operate.



WIRING DIAGRAM:





10L1	CHECK OUTPUT OF ABS SENSOR USING SELECT MONITOR.

Read the ABS sensor output corresponding to the faulty system in the select monitor function mode.

NOTE:
The select monitor display shows that the front right wheel is rotating at 30 km/h.

CHECK ***: Does the speed indicated on the display change in response to the speedometer reading during acceleration/deceleration when the steering wheel is in the straight-ahead position?***

YES : Go to step **10L2.**

NO : Go to step **10L3.**

10L2	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND ABS SENSOR.

CHECK ***: Is there poor contact in connectors between ABSCM and ABS sensor?***

YES : Repair connector.

NO : Go to step **10L3.**

10L3	CHECK SOURCES OF SIGNAL NOISE.

CHECK ***: Is the car telephone or the wireless transmitter properly installed?***

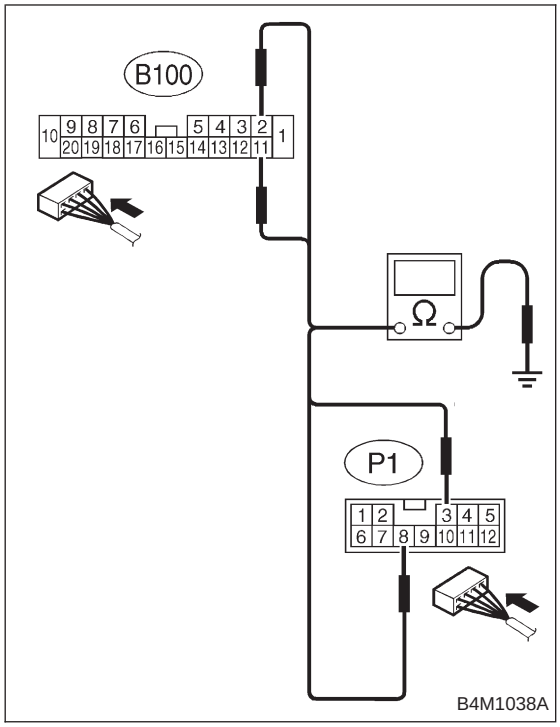
YES : Go to next CHECK .

NO : Properly install the car telephone or the wireless transmitter.

CHECK ***: Are noise sources (such as an antenna) installed near the sensor harness?***

YES : Install the noise sources apart from the sensor harness.

NO : Go to step **10L4.**



10L4	CHECK SHIELD CIRCUIT.

1) Connect all connectors.
2) Measure resistance between shield connector and chassis ground.

CHECK ***: Trouble code/Connector & terminal***
22/(B100) No. 11 — Chassis ground
24/(B100) No. 2 — Chassis ground
26/(P1) No. 8 — Chassis ground
28/(P1) No. 3 — Chassis ground
Is resistance less than 0.5 Ω?

YES : Go to step **10L5.**

NO : Repair shield harness.

10L5	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary noise interference.

10L6	CHECK ABS SENSOR MECHANICAL TROUBLE.

CHECK : ***Tightening torque:***
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)
Are the ABS sensor installation bolts tightened securely?

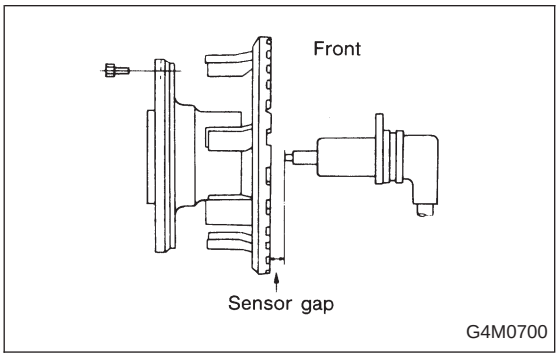
YES : Go to next CHECK .

NO : Tighten ABS sensor installation bolts securely.

CHECK : ***Tightening torque:***
13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)
Are the tone wheel installation bolts tightened securely?

YES : Go to next step.

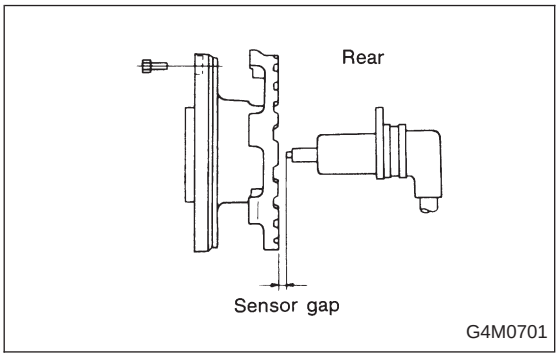
NO : Tighten tone wheel installation bolts securely.



1) Measure tone wheel to pole piece gap over entire perimeter of the wheel.

CHECK : ***Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)



YES : Go to next CHECK .

NO : Adjust the gap.

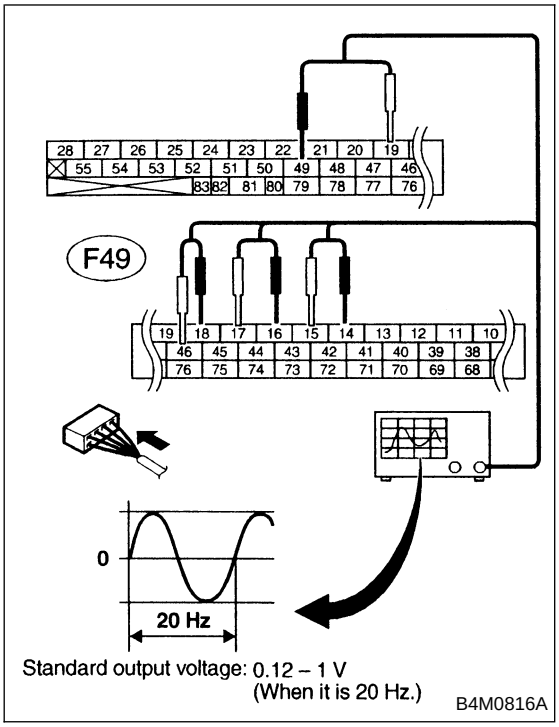
NOTE:
Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

CHECK : ***Is an oscilloscope available?***

YES : Go to next step.

NO : Go to step 10).

2) Raise all four wheels of ground.
3) Turn ignition switch OFF.
4) Disconnect connector from ABS control module.
5) Disconnect connector cover from connector.
<Ref. to 4-4c [T8C1] steps 5) to 8).>
6) Connect connector to ABS control module.
7) Connect the oscilloscope to the ABS control module connector in accordance with trouble code.
8) Turn ignition switch ON.



9) Rotate wheels and measure voltage at specified frequency.

NOTE:
When this inspection is completed, the ABS control module sometimes stores the trouble code 29.

TROUBLE CODE / Connector & terminal:
22 / (F49) No. 14 (+) — No. 15 (−)
24 / (F49) No. 49 (+) — No. 19 (−)
26 / (F49) No. 18 (+) — No. 46 (−)
28 / (F49) No. 16 (+) — No. 17 (−)
Specified voltage: 0.12 — 1 V (When it is 20 Hz.)

CHECK ***: Is oscilloscope pattern smooth, as shown in figure?***

YES : Go to step **10L7.**

NO : Go to next step.

10) Remove disc rotor from hub in accordance with trouble code.

CHECK ***: Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?***

YES : Thoroughly remove dirt or other foreign matter.

NO : Go to next CHECK .

CHECK ***: Are there broken or damaged teeth in the ABS sensor pole piece or the tone wheel?***

YES : Replace ABS sensor or tone wheel.

NO : Go to next step.

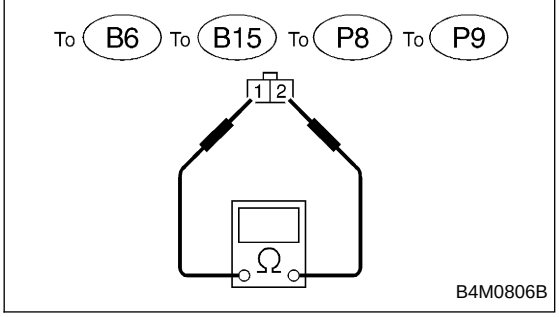
11) Measure hub runout.

CHECK ***: Is the runout less than 0.05 mm (0.0020 in)?***

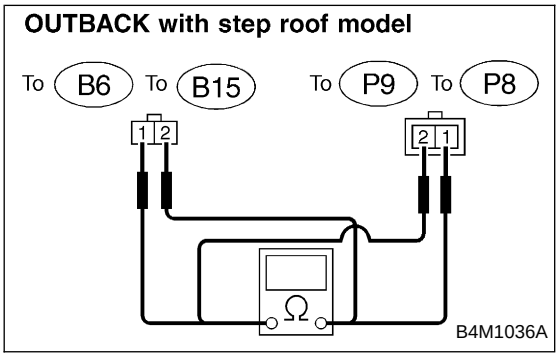
YES : Go to step **10L7.**

NO : Repair hub.

Except OUTBACK with step roof model



OUTBACK with step roof model



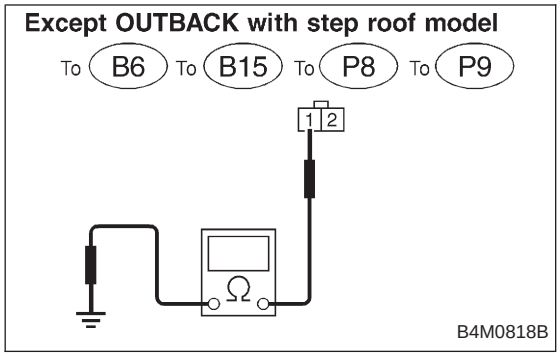
10L7	CHECK RESISTANCE OF ABS SENSOR.

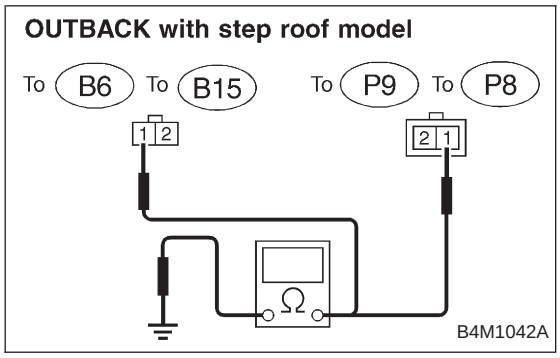
1) Turn ignition switch OFF.
2) Disconnect connector from ABS sensor.
3) Measure resistance between ABS sensor connector terminals.

CHECK ***: Trouble code/Connector & terminal***
22/to (B6) No. 1 — No. 2
24/to (B15) No. 1 — No. 2
26/to (P8) No. 1 — No. 2
28/to (P9) No. 1 — No. 2
Is resistance 0.8 — 1.2 kΩ?

YES : Go to step **10L8.**

NO : Replace ABS sensor.





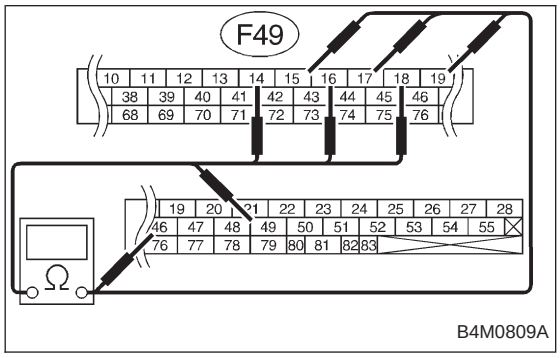
10L8	CHECK GROUND SHORT OF ABS SENSOR.

Measure resistance between ABS sensor and chassis ground.

CHECK ***: Trouble code/Connector & terminal***
22/to (B6) No. 1 — Chassis ground
24/to (B15) No. 1 — Chassis ground
26/to (P8) No. 1 — Chassis ground
28/to (P9) No. 1 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10L9.**

NO : Replace ABS sensor.



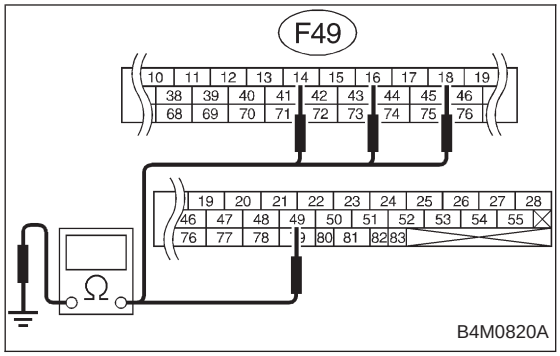
10L9	CHECK HARNESS CONNECTOR BETWEEN ABSCM AND ABS SENSOR.

1) Connect connector to ABS sensor.
2) Disconnect connector from ABSCM.
3) Measure resistance at ABSCM connector terminals.

CHECK ***: Trouble code/Connector & terminal***
22/(F49) No. 14 — No. 15
24/(F49) No. 49 — No. 69
26/(F49) No. 18 — No. 46
28/(F49) No. 16 — No. 17
Is resistance 0.8 — 1.2 kΩ?

YES : Go to step **10L10.**

NO : Repair harness connector between ABSCM and ABS sensor.



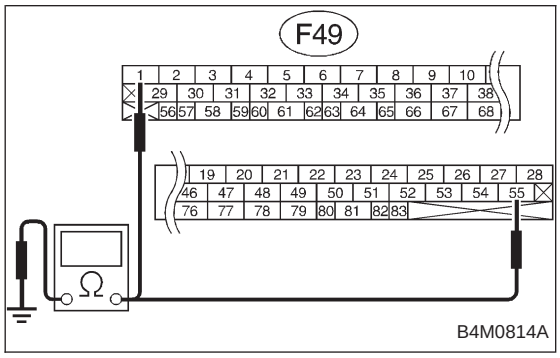
10L10	CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
22/(F49) No. 14 — Chassis ground
24/(F49) No. 49 — Chassis ground
26/(F49) No. 18 — Chassis ground
28/(F49) No. 16 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10L11.**

NO : Repair harness connector between ABSCM and ABS sensor.



10L11	CHECK GROUND CIRCUIT OF ABSCM.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM.
3) Measure resistance between ABSCM and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 1 — GND
(F49) No. 55 — GND
Is resistance less than 0.5 Ω?

YES : Go to step **10L12.**

NO : Repair ABSCM ground harness.

10L12	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND ABS SENSOR.

CHECK : ***Is there poor contact in connectors between ABSCM and ABS sensor?***

YES : Repair connector.

NO : Go to step **10L13.**

10L13	CHECK SOURCES OF SIGNAL NOISE.

CHECK ***: Is the car telephone or the wireless transmitter properly installed?***

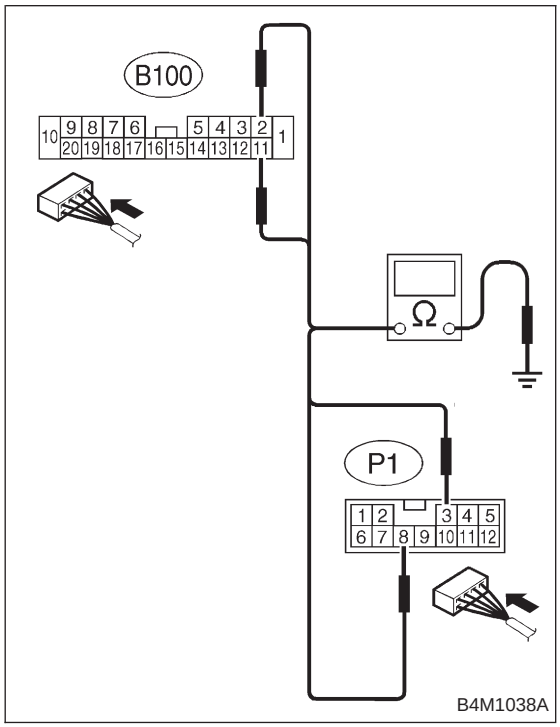
YES : Go to next CHECK .

NO : Properly install the car telephone or the wireless transmitter.

CHECK ***: Are noise sources (such as an antenna) installed near the sensor harness?***

YES : Install the noise sources apart from the sensor harness.

NO : Go to step **10L14.**



10L14	CHECK SHIELD CIRCUIT.

1) Connect all connectors.
2) Measure resistance between shield connector and chassis ground.

CHECK ***: Trouble code/Connector & terminal***
22/(B100) No. 11 — Chassis ground
24/(B100) No. 2 — Chassis ground
26/(P1) No. 8 — Chassis ground
28/(P1) No. 3 — Chassis ground
Is resistance less than 0.5 Ω?

YES : Go to step **10L15.**

NO : Repair shield harness.

10L15	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary noise interference.

M: 29 EITHER. SS SOFT — ABNORMAL ABS SENSOR SIGNAL (ANY ONE OF FOUR) —

DIAGNOSIS:

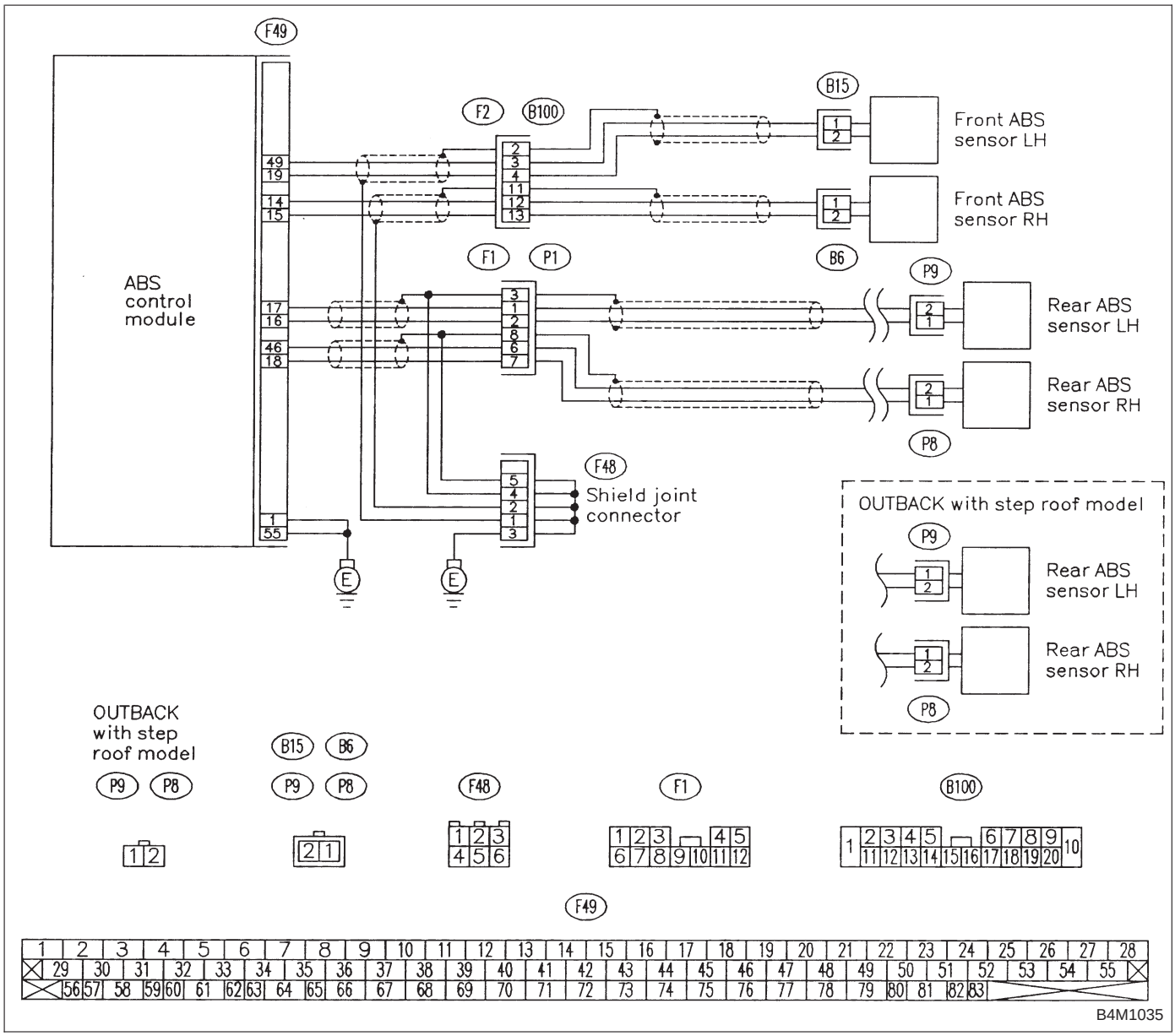
- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty tone wheel
- Wheels turning freely for a long time

TROUBLE SYMPTOM:

- ABS does not operate.

10M1.	**Check if the wheels have turned freely for a long time.**
↓	
10M2.	**Check tire.**
↓	
10M3.	**Check ABS sensor mechanical trouble.**
↓	
10M4.	**Check ABSCM.**

WIRING DIAGRAM:



10M1	CHECK IF THE WHEELS HAVE TURNED FREELY FOR A LONG TIME.

CHECK : ***Check if the wheels have been turned freely for more than one minute, such as when the vehicle is jacked-up, under full-lock cornering or when tire is not in contact with road surface.***

YES : The ABS is normal. Erase the trouble code.

NOTE:
When the wheels turn freely for a long time, such as when the vehicle is towed or jacked-up, or when steering wheel is continuously turned all the way, this trouble code may sometimes occur.

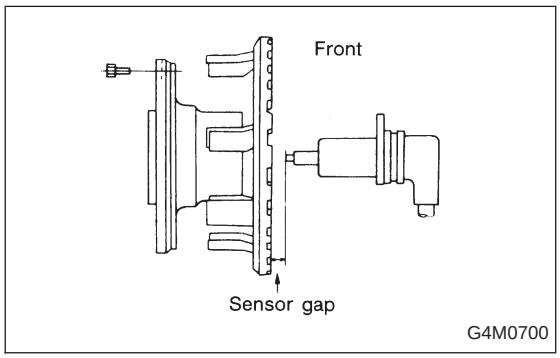
NO : Go to step **10M2.**

10M2	CHECK TIRE.

CHECK : ***Are the tire specifications correct?***
YES : Go to next CHECK .
NO : Replace tire.
CHECK : ***Is the tire worn excessively?***
YES : Replace tire.
NO : Go to next CHECK .
CHECK : ***Is the tire pressure correct?***
YES : Go to step **10M3.**
NO : Adjust tire pressure.

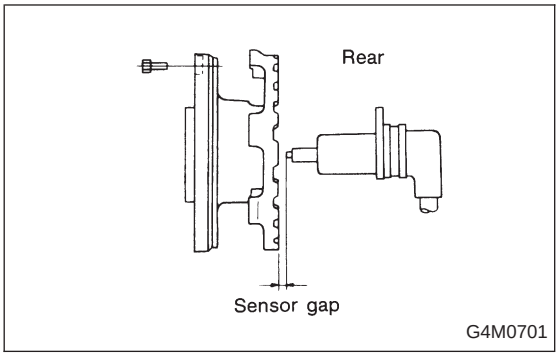
10M3	CHECK ABS SENSOR MECHANICAL TROUBLE.

CHECK : ***Tightening torque:***
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)
Are the ABS sensor installation bolts tightened securely?
YES : Go to next CHECK .
NO : Tighten ABS sensor installation bolts securely.
CHECK : ***Tightening torque:***
13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)
Are the ABS sensor installation bolts tightened securely?
YES : Go to next step.
NO : Tighten ABS sensor installation bolts securely.



1) Measure tone wheel to pole piece gap over entire perimeter of the wheel.
CHECK : ***Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

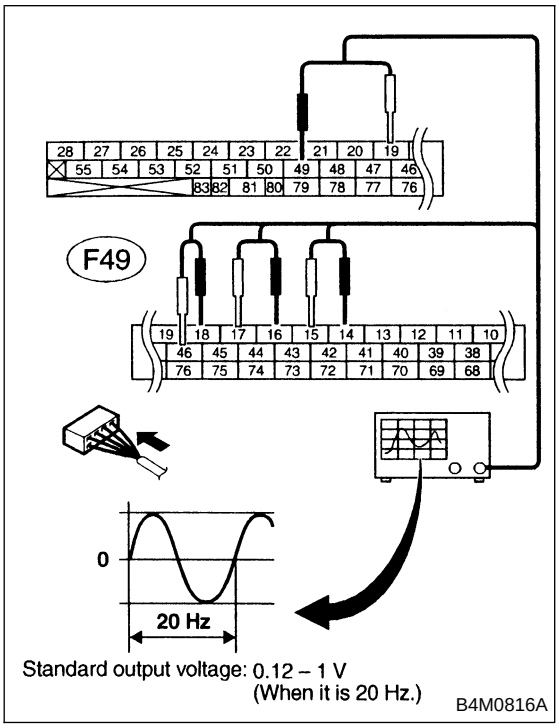


YES : Go to next CHECK .
NO : Adjust the gap.

NOTE:
Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

CHECK ***: Is an oscilloscope available?***
YES : Go to next step.
NO : Go to step 10).

2) Raise all four wheels of ground.
3) Turn ignition switch OFF.
4) Disconnect connector from ABS control module.
5) Disconnect connector cover from connector.
<Ref. to 4-4c [T8C1] steps 5) to 8).>
6) Connect connector to ABS control module.
7) Connect the oscilloscope to the ABS control module connector.
8) Turn ignition switch ON.



9) Rotate wheels and measure voltage at specified frequency.

NOTE:
When this inspection is completed, the ABS control module sometimes stores the trouble code 29.

TROUBLE CODE / Connector & terminal:
(F49) No. 14 (+) — No. 15 (−) (Front RH)
(F49) No. 49 (+) — No. 19 (−) (Front LH)
(F49) No. 18 (+) — No. 46 (−) (Rear RH)
(F49) No. 16 (+) — No. 17 (−) (Rear LH)
Specified voltage: 0.12 — 1 V (When it is 20 Hz.)

CHECK ***: Is oscilloscope pattern smooth, as shown in figure?***
YES : Go to step **10M4.**
NO : Go to next step.

10) Remove disc rotor from hub.

CHECK ***: Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?***
YES : Thoroughly remove dirt or other foreign matter.
NO : Go to next CHECK .

CHECK ***: Are there broken or damaged teeth in the ABS sensor pole piece or the tone wheel?***

YES : Replace ABS sensor or tone wheel.

NO : Go to next step.

11) Measure hub runout.

CHECK ***: Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **10M4.**

NO : Repair hub.

10M4	CHECK ABSCM.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

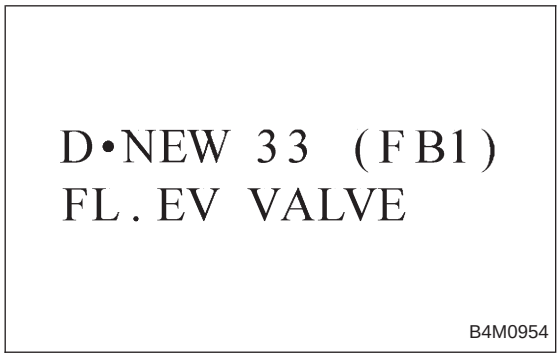
NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

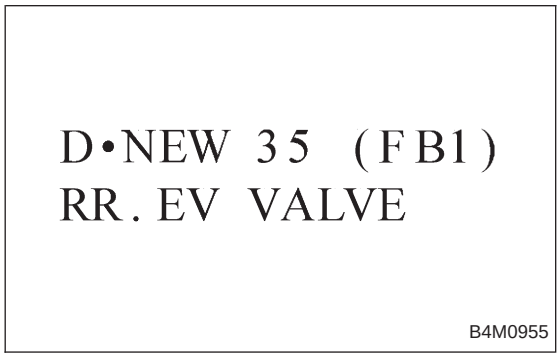
YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

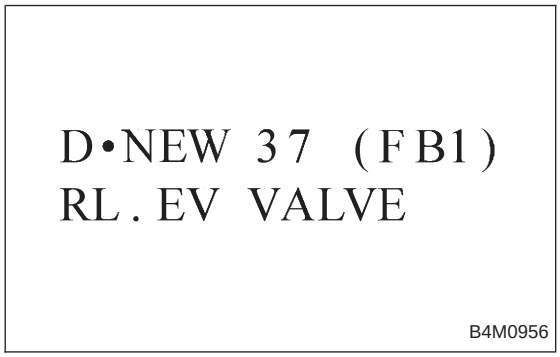
N: 31 FR. EV VALVE
— ABNORMAL FRONT RH INLET SOLENOID VALVE —



O: 33 FL. EV VALVE
— ABNORMAL FRONT LH INLET SOLENOID VALVE —



P: 35 RR. EV VALVE
— ABNORMAL REAR RH INLET SOLENOID VALVE —



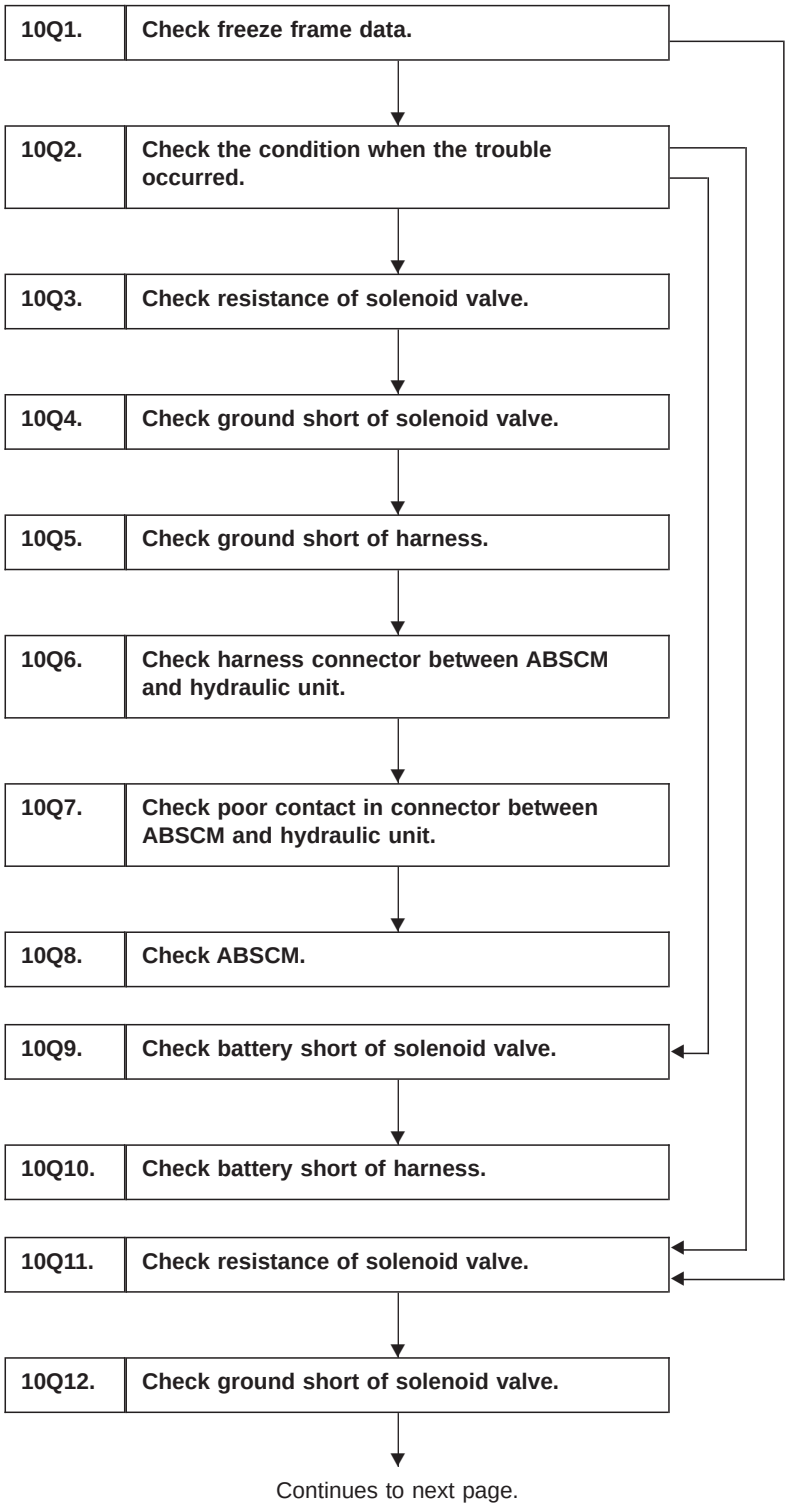
Q: 37 RL. EV VALVE
— ABNORMAL REAR LH INLET SOLENOID VALVE —

DIAGNOSIS:

- Faulty harness/connector
- Faulty inlet solenoid valve in hydraulic unit

TROUBLE SYMPTOM:

- ABS does not operate.

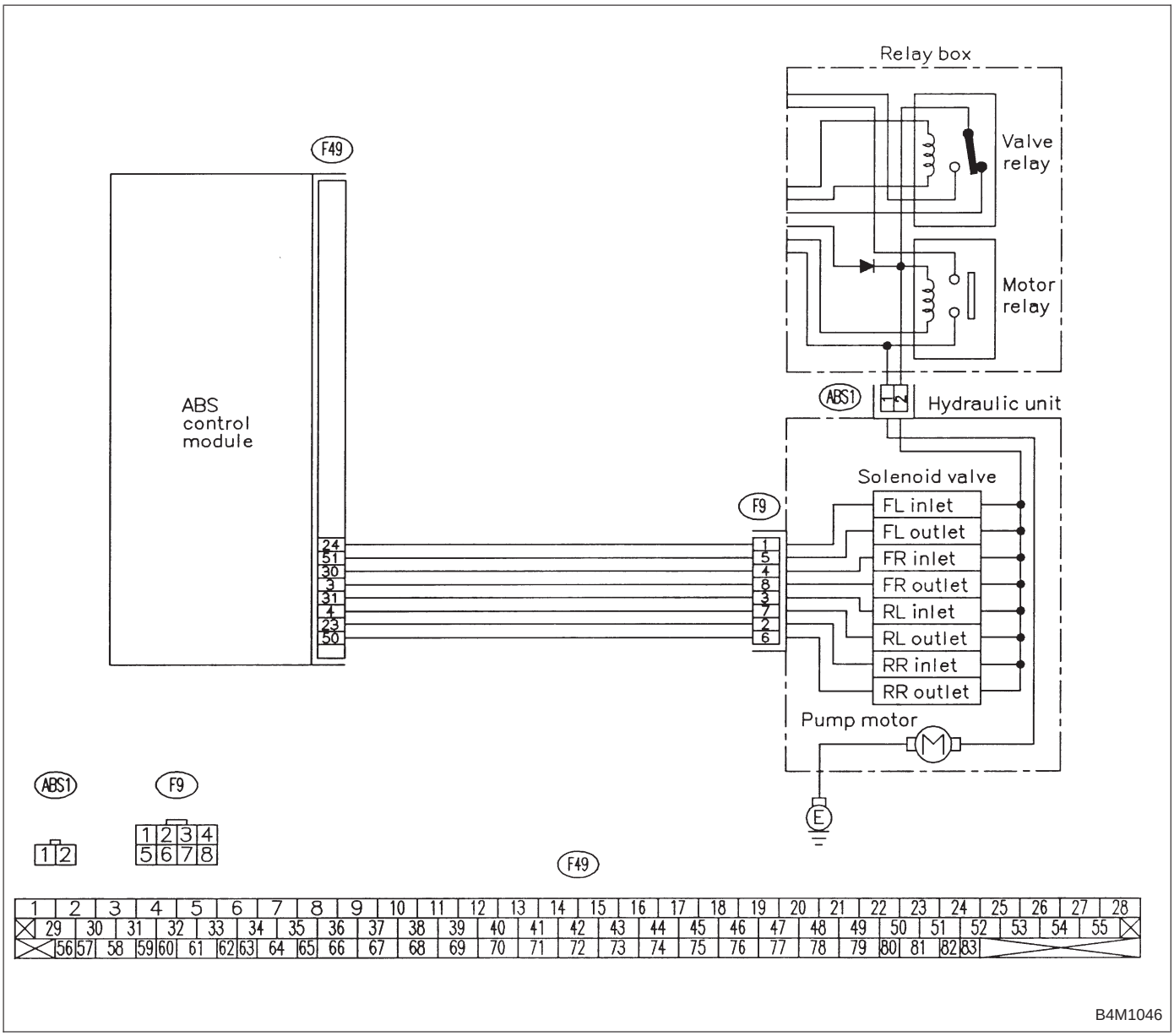


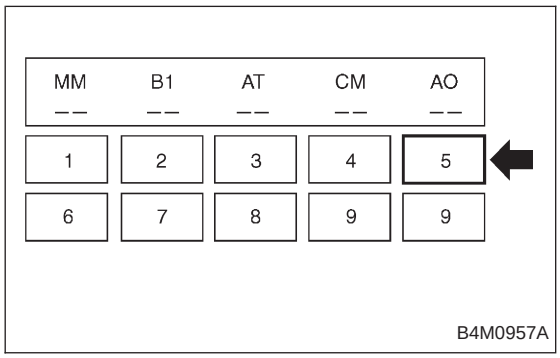
Continues to next page.

From the former page.

10Q13.	**Check battery short of solenoid valve.**
10Q14.	**Check battery short of harness.**
10Q15.	**Check ground short of harness.**
10Q16.	**Check harness connector between ABSCM and hydraulic unit.**
10Q17.	**Check poor contact in connector between ABSCM and hydraulic unit.**
10Q18.	**Check ABSCM.**

WIRING DIAGRAM:





10Q1	CHECK FREEZE FRAME DATA.

Press F , E , 1 and 5 on the select monitor.

CHECK ***: Is the select monitor LED 5 off? Was the ABS inactive when the problem occurred?***

YES : Go to step **10Q2.**

NO : Go to step **10Q11.**

10Q2	CHECK THE CONDITION WHEN THE TROUBLE OCCURRED.

Ask the vehicle owner about driving conditions when the trouble occurred. Attempt to duplicate the conditions.

CHECK ***: Is the trouble immediately apparent?***

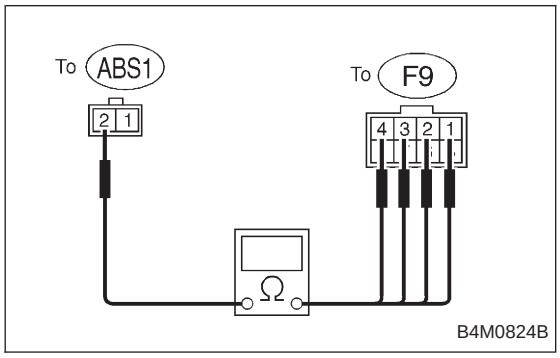
YES : Go to next CHECK .

NO : Go to step 11.

CHECK ***: Did the trouble occur immediately after engine starting or during standing starts?***

YES : Go to step **10Q9.**

NO : Go to step **10Q3.**



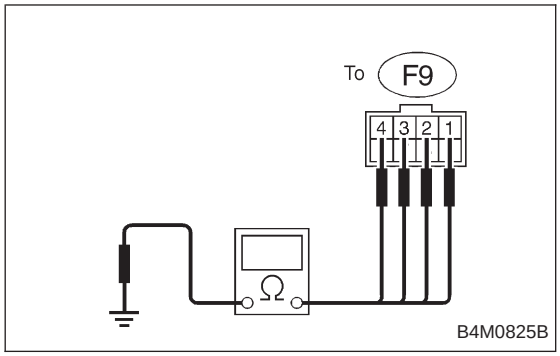
10Q3	CHECK RESISTANCE OF SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
3) Measure resistance between hydraulic unit connector terminals.

CHECK ***: Trouble code/Connector & terminal***
31/to (F9) No. 4 — to (ABS1) No. 2
33/to (F9) No. 1 — to (ABS1) No. 2
35/to (F9) No. 2 — to (ABS1) No. 2
37/to (F9) No. 3 — to (ABS1) No. 2
Is resistance 8.5±0.7 Ω?

YES : Go to step **10Q4.**

NO : Replace hydraulic unit.



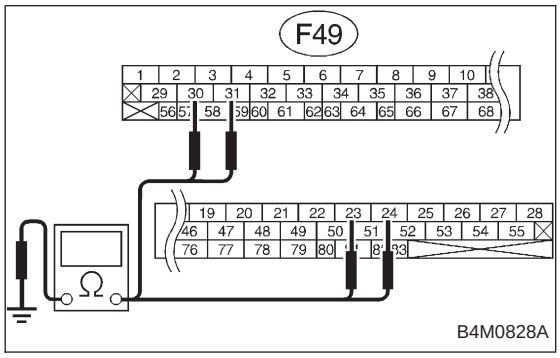
10Q4	CHECK GROUND SHORT OF SOLENOID VALVE.

Measure resistance between hydraulic unit connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
31/to (F9) No. 4 — Chassis ground
33/to (F9) No. 1 — Chassis ground
35/to (F9) No. 2 — Chassis ground
37/to (F9) No. 3 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10Q5.**

NO : Replace hydraulic unit.



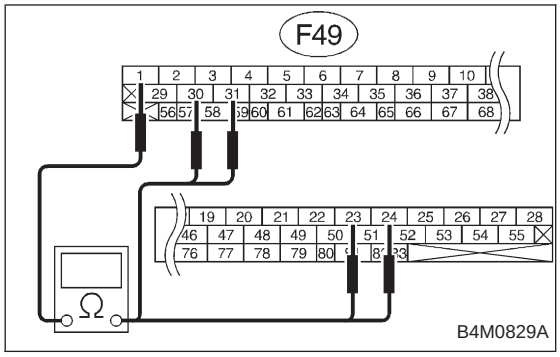
10Q5	CHECK GROUND SHORT OF HARNESS.

1) Disconnect connector from ABSCM.
2) Measure resistance between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
31/(F49) No. 30 — Chassis ground
33/(F49) No. 24 — Chassis ground
35/(F49) No. 23 — Chassis ground
37/(F49) No. 31 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10Q6.**

NO : Repair harness between ABSCM and hydraulic unit.



10Q6	CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

1) Connect connector to hydraulic unit.
2) Measure resistance between ABSCM connector terminals.

CHECK ***: Trouble code/Connector & terminal***
31/(F49) No. 30 — No. 1
33/(F49) No. 24 — No. 1
35/(F49) No. 23 — No. 1
37/(F49) No. 31 — No. 1
Is resistance 9.0±0.7 Ω?

YES : Go to step **10Q7.**

NO : Repair harness connector between ABSCM and hydraulic unit.

10Q7	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

CHECK ***: Is there poor contact in connectors between ABSCM and hydraulic unit?***

YES : Repair connector.

NO : Go to step **10Q8.**

10Q8	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

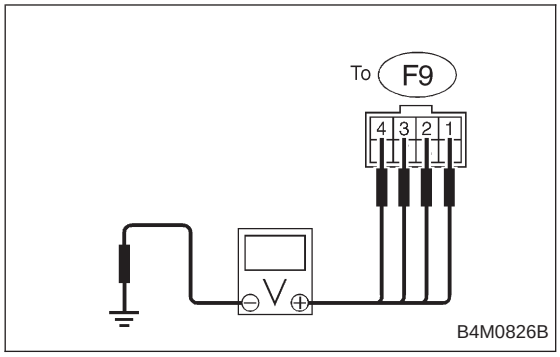
YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



10Q9	CHECK BATTERY SHORT OF SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
3) Disconnect connector from ABSCM.
4) Turn ignition switch to ON.
5) Measure voltage between hydraulic unit connector and chassis ground.

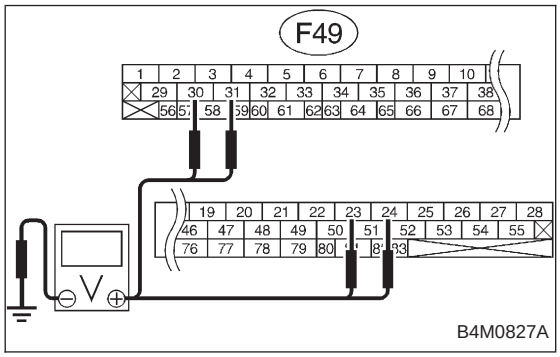
CHECK : ***Trouble code/Connector & terminal***
31/to (F9) No. 4 (+) — Chassis ground (−)
33/to (F9) No. 1 (+) — Chassis ground (−)
35/to (F9) No. 2 (+) — Chassis ground (−)
37/to (F9) No. 3 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.
NO : Replace hydraulic unit.

6) Turn ignition switch to OFF.
7) Measure voltage between hydraulic unit connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
31/to (F9) No. 4 (+) — Chassis ground (−)
33/to (F9) No. 1 (+) — Chassis ground (−)
35/to (F9) No. 2 (+) — Chassis ground (−)
37/to (F9) No. 3 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10Q10.**
NO : Replace hydraulic unit.



10Q10	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
31/(F49) No. 30 (+) — Chassis ground (−)
33/(F49) No. 24 (+) — Chassis ground (−)
35/(F49) No. 23 (+) — Chassis ground (−)
37/(F49) No. 31 (+) — Chassis ground (−)
Is voltage 0 V?

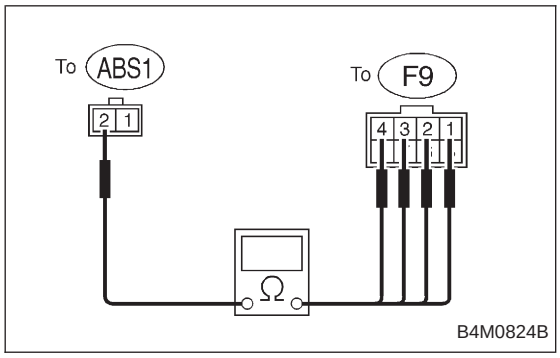
YES : Go to next step.
NO : Repair harness between ABSCM and hydraulic unit.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Trouble code/Connector & terminal***
31/(F49) No. 30 (+) — Chassis ground (−)
33/(F49) No. 24 (+) — Chassis ground (−)
35/(F49) No. 23 (+) — Chassis ground (−)
37/(F49) No. 31 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Replace ABSCM.

NO : Repair harness between ABSCM and hydraulic unit.



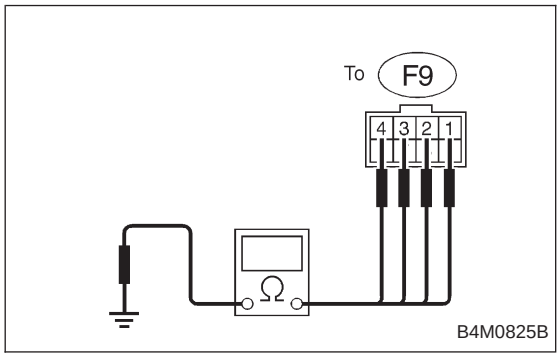
10Q11	CHECK RESISTANCE OF SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
3) Measure resistance between hydraulic unit connector terminals.

CHECK ***: Trouble code/Connector & terminal***
31/to (F9) No. 4 — to (ABS1) No. 2
33/to (F9) No. 1 — to (ABS1) No. 2
35/to (F9) No. 2 — to (ABS1) No. 2
37/to (F9) No. 3 — to (ABS1) No. 2
Is resistance 8.5±0.7 Ω?

YES : Go to step **10Q12.**

NO : Replace hydraulic unit.



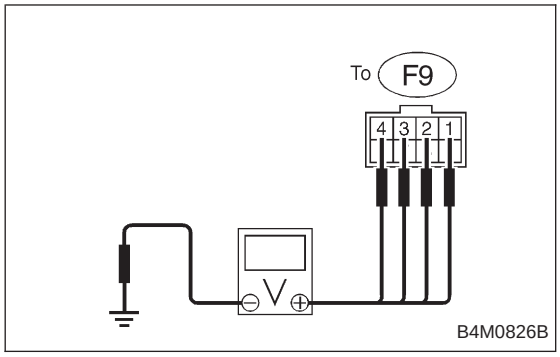
10Q12	CHECK GROUND SHORT OF SOLENOID VALVE.

Measure resistance between hydraulic unit connector and chassis ground.

CHECK ***: Trouble code/Connector & terminal***
31/to (F9) No. 4 — Chassis ground
33/to (F9) No. 1 — Chassis ground
35/to (F9) No. 2 — Chassis ground
37/to (F9) No. 3 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10Q13.**

NO : Replace hydraulic unit.



10Q13	CHECK BATTERY SHORT OF SOLENOID VALVE.

1) Disconnect connector from ABSCM.
2) Turn ignition switch to ON.
3) Measure voltage between hydraulic unit connector and chassis ground.

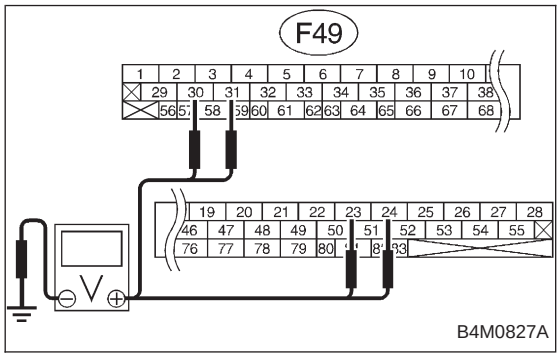
CHECK : ***Trouble code/Connector & terminal***
31/to (F9) No. 4 (+) — Chassis ground (−)
33/to (F9) No. 1 (+) — Chassis ground (−)
35/to (F9) No. 2 (+) — Chassis ground (−)
37/to (F9) No. 3 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.
NO : Replace hydraulic unit.

4) Turn ignition switch to OFF.
5) Measure voltage between hydraulic unit connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
31/to (F9) No. 4 (+) — Chassis ground (−)
33/to (F9) No. 1 (+) — Chassis ground (−)
35/to (F9) No. 2 (+) — Chassis ground (−)
37/to (F9) No. 3 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10Q14.**
NO : Replace hydraulic unit.



10Q14	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
31/(F49) No. 30 (+) — Chassis ground (−)
33/(F49) No. 24 (+) — Chassis ground (−)
35/(F49) No. 23 (+) — Chassis ground (−)
37/(F49) No. 31 (+) — Chassis ground (−)
Is voltage 0 V?

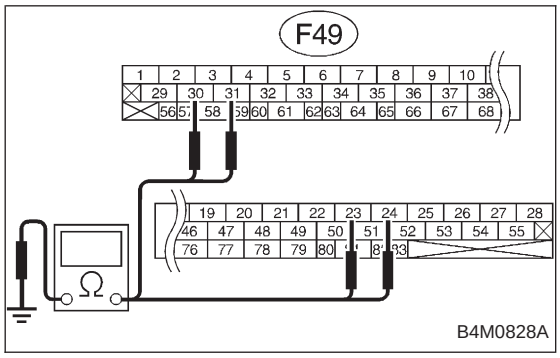
YES : Go to next step.
NO : Repair harness between ABSCM and hydraulic unit.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Trouble code/Connector & terminal***
31/(F49) No. 30 (+) — Chassis ground (−)
33/(F49) No. 24 (+) — Chassis ground (−)
35/(F49) No. 23 (+) — Chassis ground (−)
37/(F49) No. 31 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10Q15.**

NO : Repair harness between ABSCM and hydraulic unit.



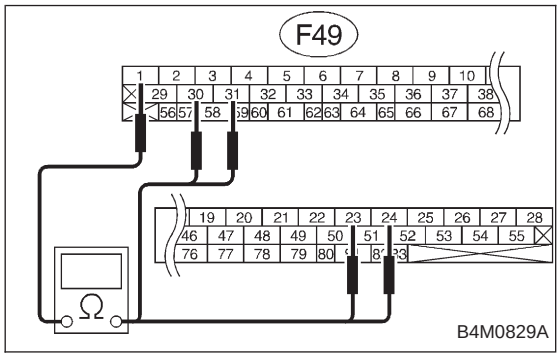
10Q15	CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Trouble code/Connector & terminal***
31/(F49) No. 30 — Chassis ground
33/(F49) No. 24 — Chassis ground
35/(F49) No. 23 — Chassis ground
37/(F49) No. 31 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10Q16.**

NO : Repair harness between ABSCM and hydraulic unit.



10Q16	CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

1) Connect connector to hydraulic unit.
2) Measure resistance between ABSCM connector terminals.

CHECK ***: Trouble code/Connector & terminal***
31/(F49) No. 30 — No. 1
33/(F49) No. 24 — No. 1
35/(F49) No. 23 — No. 1
37/(F49) No. 31 — No. 1
Is resistance 9.0±0.7 Ω?

YES : Go to step **10Q17.**

NO : Repair harness connector between ABSCM and hydraulic unit.

10Q17	**CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

CHECK : ***Is there poor contact in connectors between ABSCM and hydraulic unit?***

YES : Repair connector.

NO : Go to step **10Q18.**

10Q18	**CHECK ABSCM.**

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

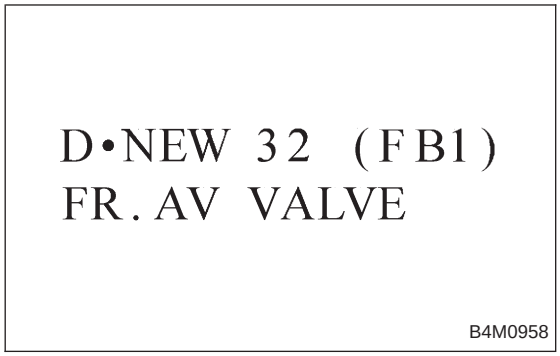
YES : Replace ABSCM.

NO : Go to next CHECK .

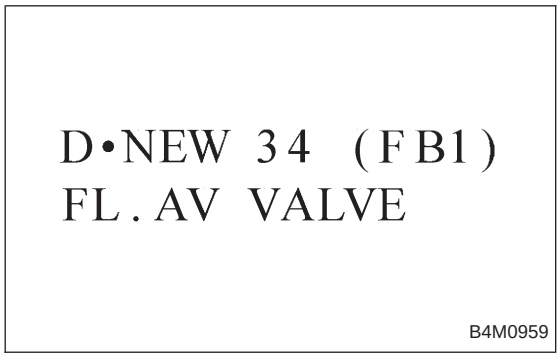
CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

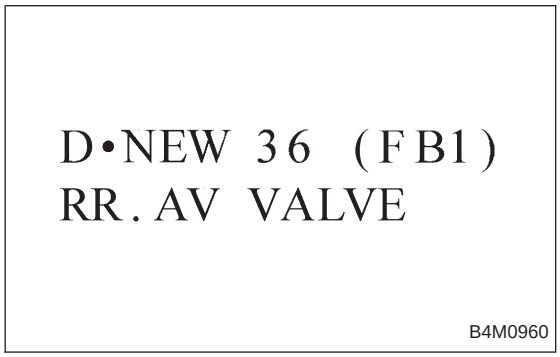
NO : A temporary poor contact.



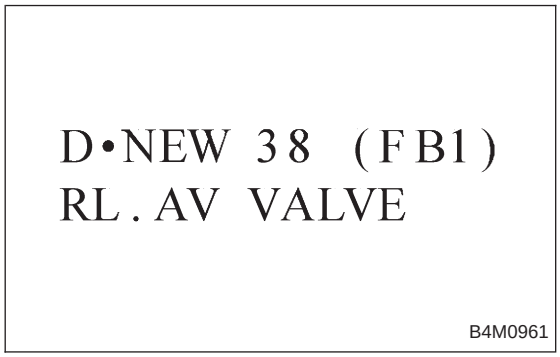
R: 32 FR. AV VALVE
— ABNORMAL FRONT RH OUTLET SOLENOID VALVE —



S: 34 FL. AV VALVE
— ABNORMAL FRONT LH OUTLET SOLENOID VALVE —



T: 36 RR. AV VALVE
— ABNORMAL REAR RH OUTLET SOLENOID VALVE —



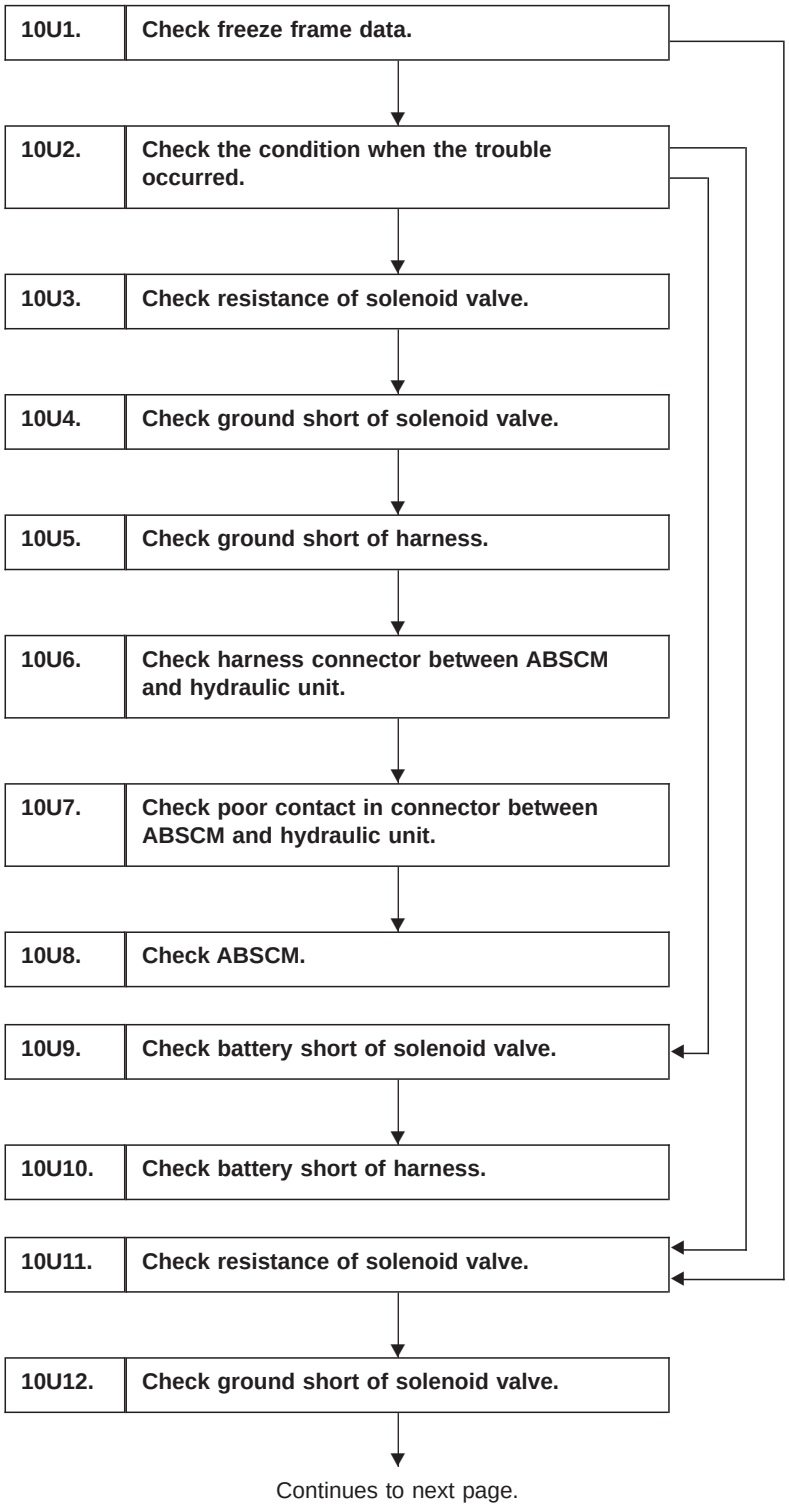
U: 38 RL. AV VALVE
— ABNORMAL REAR LH OUTLET SOLENOID VALVE —

DIAGNOSIS:

- Faulty harness/connector
- Faulty outlet solenoid valve in hydraulic unit

TROUBLE SYMPTOM:

- ABS does not operate.

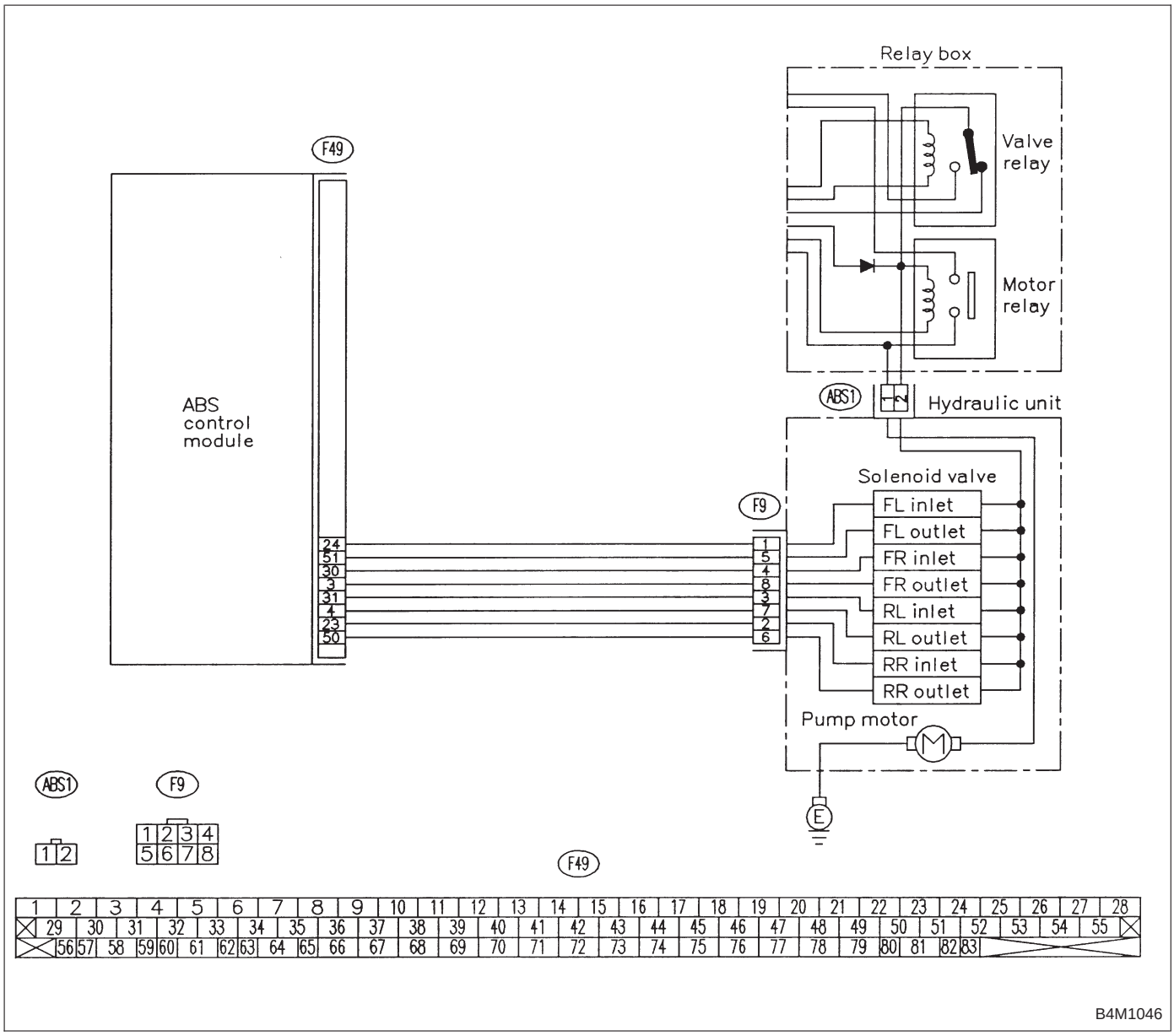


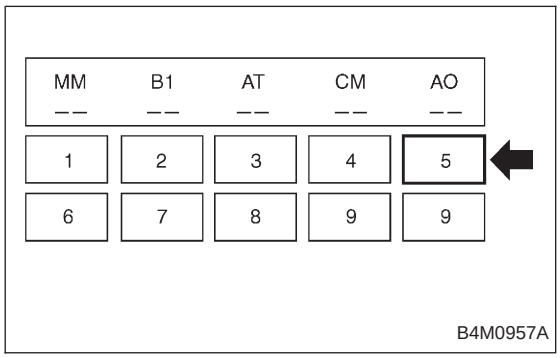
Continues to next page.

From the former page.

10U13.	**Check battery short of solenoid valve.**
10U14.	**Check battery short of harness.**
10U15.	**Check ground short of harness.**
10U16.	**Check harness connector between ABSCM and hydraulic unit.**
10U17.	**Check poor contact in connector between ABSCM and hydraulic unit.**
10U18.	**Check ABSCM.**

WIRING DIAGRAM:





10U1	CHECK FREEZE FRAME DATA.

Press F , E , 1 and 5 on the select monitor.

CHECK ***: Is the select monitor LED 5 off? Was the ABS inactive when the problem occurred?***

YES : Go to step **10U2.**

NO : Go to step **10U11.**

10U2	CHECK THE CONDITION WHEN THE TROUBLE OCCURRED.

Ask the vehicle owner about driving conditions when the trouble occurred. Attempt to duplicate the conditions.

CHECK ***: Is the trouble immediately apparent?***

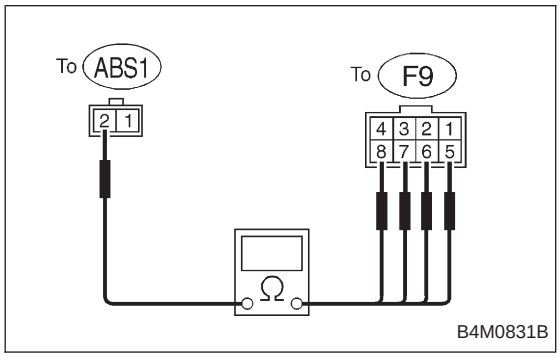
YES : Go to next CHECK .

NO : Go to step **10U11.**

CHECK ***: Did the trouble occur immediately after engine starting or during standing starts?***

YES : Go to step **10U9.**

NO : Go to step **10U3.**



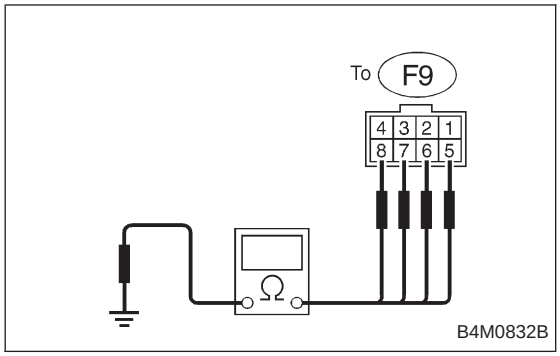
10U3	CHECK RESISTANCE OF SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
3) Measure resistance between hydraulic unit connector terminals.

CHECK ***: Trouble code/Connector & terminal***
32/to (F9) No. 8 — to (ABS1) No. 2
34/to (F9) No. 5 — to (ABS1) No. 2
36/to (F9) No. 6 — to (ABS1) No. 2
38/to (F9) No. 7 — to (ABS1) No. 2
Is resistance 4.3±0.5 Ω?

YES : Go to step **10U4.**

NO : Replace hydraulic unit.



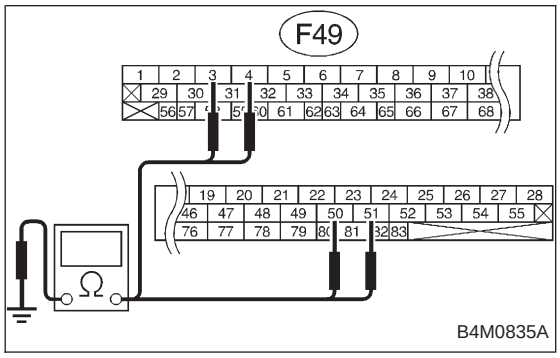
10U4	CHECK GROUND SHORT OF SOLENOID VALVE.

Measure resistance between hydraulic unit connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
32/to (F9) No. 8 — Chassis ground
34/to (F9) No. 5 — Chassis ground
36/to (F9) No. 6 — Chassis ground
38/to (F9) No. 7 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10U5.**

NO : Replace hydraulic unit.



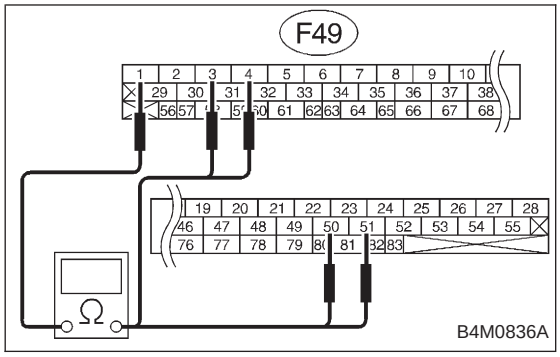
10U5	CHECK GROUND SHORT OF HARNESS.

1) Disconnect connector from ABSCM.
2) Measure resistance between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
32/(F49) No. 3 — Chassis ground
34/(F49) No. 51 — Chassis ground
36/(F49) No. 50 — Chassis ground
38/(F49) No. 4 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10U6.**

NO : Repair harness between ABSCM and hydraulic unit.



10U6	CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

1) Connect connector to hydraulic unit.
2) Measure resistance between ABSCM connector terminals.

CHECK ***: Trouble code/Connector & terminal***
32/(F49) No. 3 — No. 1
34/(F49) No. 51 — No. 1
36/(F49) No. 50 — No. 1
38/(F49) No. 4 — No. 1
Is resistance 4.8±0.5 Ω?

YES : Go to step **10U7.**

NO : Repair harness connector between ABSCM and hydraulic unit.

10U7	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

CHECK ***: Is there poor contact in connectors between ABSCM and hydraulic unit?***

YES : Repair connector.

NO : Go to step **10U8.**

10U8	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

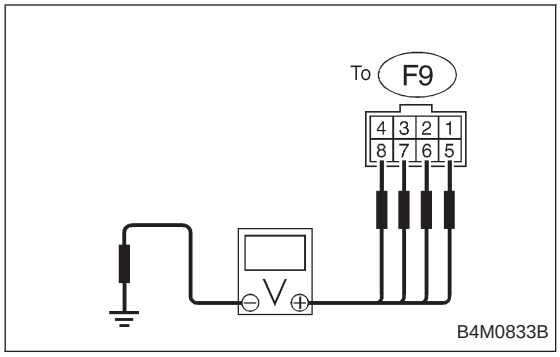
YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



10U9	CHECK BATTERY SHORT OF SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
3) Disconnect connector from ABSCM.
4) Turn ignition switch to ON.
5) Measure voltage between hydraulic unit connector and chassis ground.

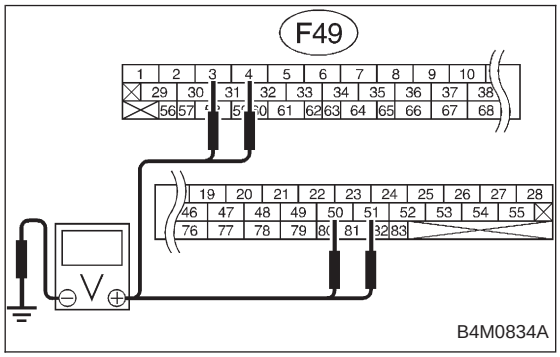
CHECK : ***Trouble code/Connector & terminal***
32/to (F9) No. 8 (+) — Chassis ground (−)
34/to (F9) No. 5 (+) — Chassis ground (−)
36/to (F9) No. 6 (+) — Chassis ground (−)
38/to (F9) No. 7 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.
NO : Replace hydraulic unit.

6) Turn ignition switch to OFF.
7) Measure voltage between hydraulic unit connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
32/to (F9) No. 8 (+) — Chassis ground (−)
34/to (F9) No. 5 (+) — Chassis ground (−)
36/to (F9) No. 6 (+) — Chassis ground (−)
38/to (F9) No. 7 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10U10.**
NO : Replace hydraulic unit.



10U10	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
32/(F49) No. 3 (+) — Chassis ground (−)
34/(F49) No. 51 (+) — Chassis ground (−)
36/(F49) No. 50 (+) — Chassis ground (−)
38/(F49) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

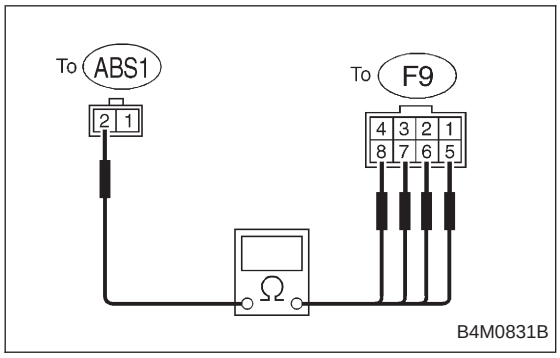
YES : Go to next step.
NO : Repair harness between ABSCM and hydraulic unit.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Trouble code/Connector & terminal***
32/(F49) No. 3 (+) — Chassis ground (−)
34/(F49) No. 51 (+) — Chassis ground (−)
36/(F49) No. 50 (+) — Chassis ground (−)
38/(F49) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Replace ABSCM.

NO : Repair harness between ABSCM and hydraulic unit.



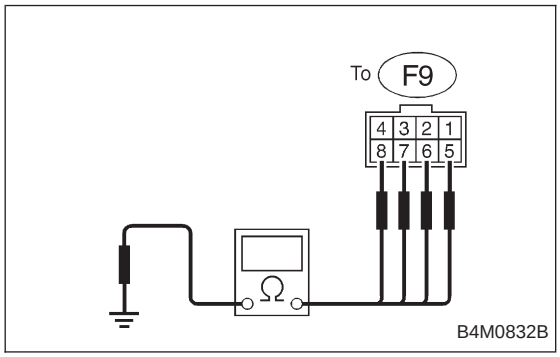
10U11	CHECK RESISTANCE OF SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
3) Measure resistance between hydraulic unit connector terminals.

CHECK ***: Trouble code/Connector & terminal***
32/to (F9) No. 8 — to (ABS1) No. 2
34/to (F9) No. 5 — to (ABS1) No. 2
36/to (F9) No. 6 — to (ABS1) No. 2
38/to (F9) No. 7 — to (ABS1) No. 2
Is resistance 4.3±0.5 Ω?

YES : Go to step **10U12.**

NO : Replace hydraulic unit.



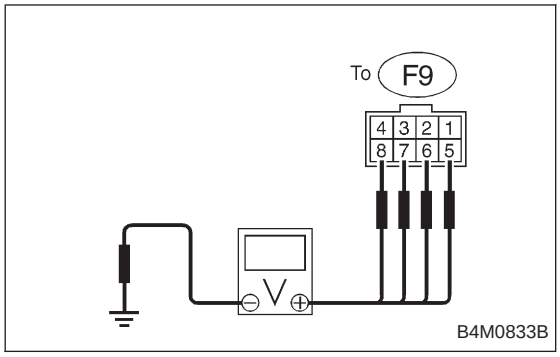
10U12	CHECK GROUND SHORT OF SOLENOID VALVE.

Measure resistance between hydraulic unit connector and chassis ground.

CHECK ***: Trouble code/Connector & terminal***
32/to (F9) No. 8 — Chassis ground
34/to (F9) No. 5 — Chassis ground
36/to (F9) No. 6 — Chassis ground
38/to (F9) No. 7 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10U13.**

NO : Replace hydraulic unit.



10U13	CHECK BATTERY SHORT OF SOLENOID VALVE.

1) Disconnect connector from ABSCM.
2) Turn ignition switch to ON.
3) Measure voltage between hydraulic unit connector and chassis ground.

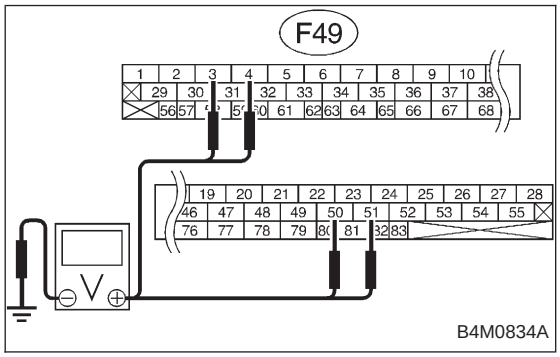
CHECK : ***Trouble code/Connector & terminal***
32/to (F9) No. 8 (+) — Chassis ground (−)
34/to (F9) No. 5 (+) — Chassis ground (−)
36/to (F9) No. 6 (+) — Chassis ground (−)
38/to (F9) No. 7 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.
NO : Replace hydraulic unit.

4) Turn ignition switch to OFF.
5) Measure voltage between hydraulic unit connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
32/to (F9) No. 8 (+) — Chassis ground (−)
34/to (F9) No. 5 (+) — Chassis ground (−)
36/to (F9) No. 6 (+) — Chassis ground (−)
38/to (F9) No. 7 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10U14.**
NO : Replace hydraulic unit.



10U14	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Trouble code/Connector & terminal***
32/(F49) No. 3 (+) — Chassis ground (−)
34/(F49) No. 51 (+) — Chassis ground (−)
36/(F49) No. 50 (+) — Chassis ground (−)
38/(F49) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

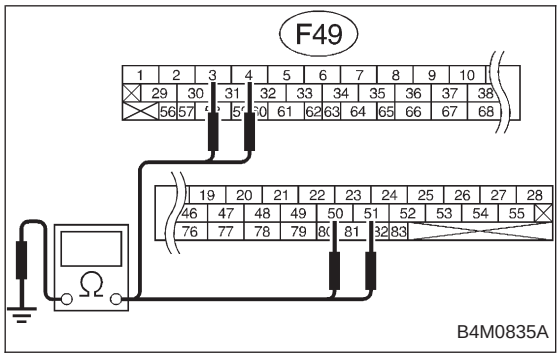
YES : Go to next step.
NO : Repair harness between ABSCM and hydraulic unit.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Trouble code/Connector & terminal***
32/(F49) No. 3 (+) — Chassis ground (−)
34/(F49) No. 51 (+) — Chassis ground (−)
36/(F49) No. 50 (+) — Chassis ground (−)
38/(F49) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10U15.**

NO : Repair harness between ABSCM and hydraulic unit.



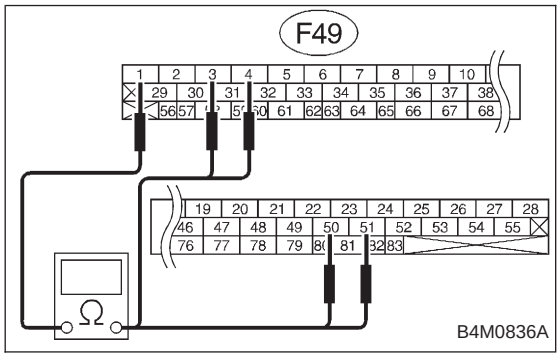
10U15	CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Trouble code/Connector & terminal***
32/(F49) No. 3 — Chassis ground
34/(F49) No. 51 — Chassis ground
36/(F49) No. 50 — Chassis ground
38/(F49) No. 4 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10U16.**

NO : Repair harness between ABSCM and hydraulic unit.



10U16	CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

1) Connect connector to hydraulic unit.
2) Measure resistance between ABSCM connector terminals.

CHECK ***: Trouble code/Connector & terminal***
32/(F49) No. 3 — No. 1
34/(F49) No. 51 — No. 1
36/(F49) No. 50 — No. 1
38/(F49) No. 4 — No. 1
Is resistance 4.8±0.5 Ω?

YES : Go to step **10U17.**

NO : Repair harness connector between ABSCM and hydraulic unit.

10U17	**CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

CHECK ***: Is there poor contact in connectors between ABSCM and hydraulic unit?***

YES : Repair connector.

NO : Go to step **10U18.**

10U18	**CHECK ABSCM.**

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 41 (FB1)
ECU

B4M0962

V: 41 ECU
— ABNORMAL ABS CONTROL MODULE —

DIAGNOSIS:

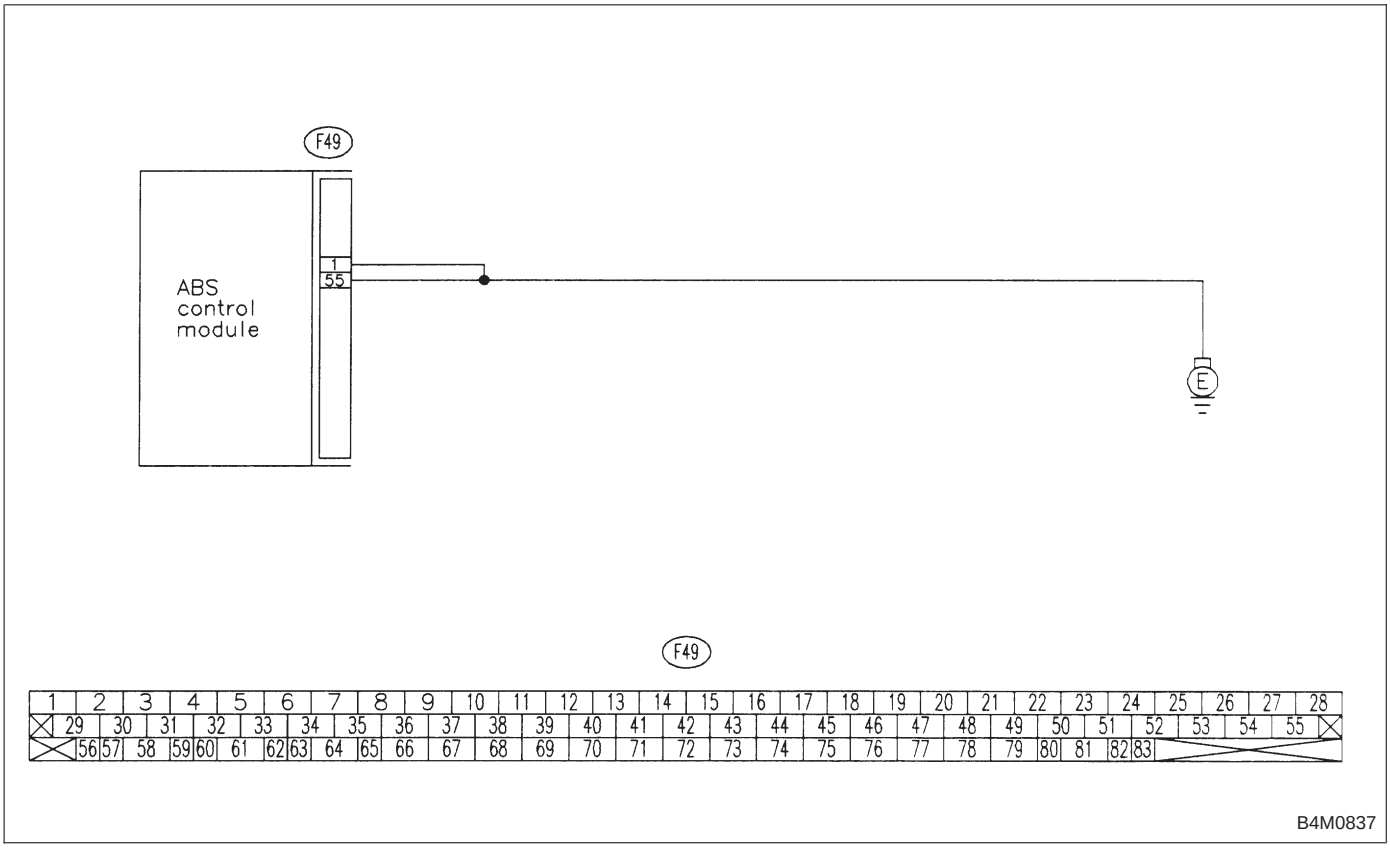
- Faulty ABSCM

TROUBLE SYMPTOM:

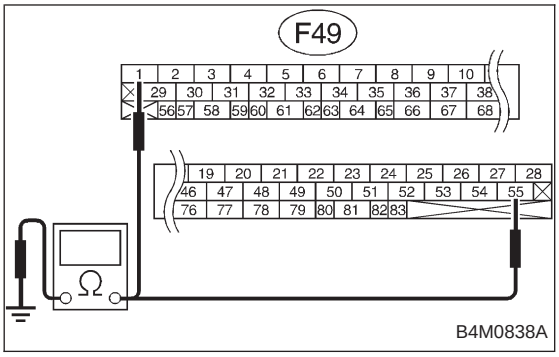
- ABS does not operate.

10V1.	**Check ground circuit of ABSCM.**
↓	
10V2.	**Check poor contact in connector between battery, ignition switch and ABSCM.**
↓	
10V3.	**Check sources of signal noise.**
↓	
10V4.	**Check ABSCM.**

WIRING DIAGRAM:



B4M0837



10V1	CHECK GROUND CIRCUIT OF ABSCM.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM.
3) Measure resistance between ABSCM and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 1 — Chassis ground
(F49) No. 55 — Chassis ground
Is resistance less than 0.5 Ω?

YES : Go to step **10V2.**

NO : Repair ABSCM ground harness.

10V2	CHECK POOR CONTACT IN CONNECTORS BETWEEN BATTERY, IGNITION SWITCH AND ABSCM.

CHECK : ***Is there poor contact in connectors between battery, ignition switch and ABSCM?***

YES : Repair connector.

NO : Go to step **10V3.**

10V3	CHECK SOURCES OF SIGNAL NOISE.

CHECK : ***Is the car telephone or the wireless transmitter properly installed?***

YES : Go to next CHECK .

NO : Properly install the car telephone or the wireless transmitter.

CHECK : ***Are noise sources (such as an antenna) installed near the sensor harness?***

YES : Install the noise sources apart from the sensor harness.

NO : Go to step **10V4.**

10V4	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

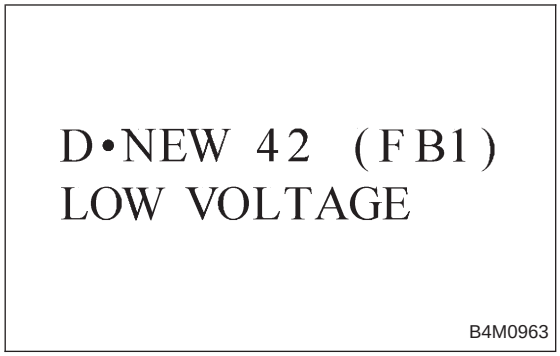
YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



W: 42 LOW VOLTAGE — SOURCE VOLTAGE IS LOW. —

DIAGNOSIS:

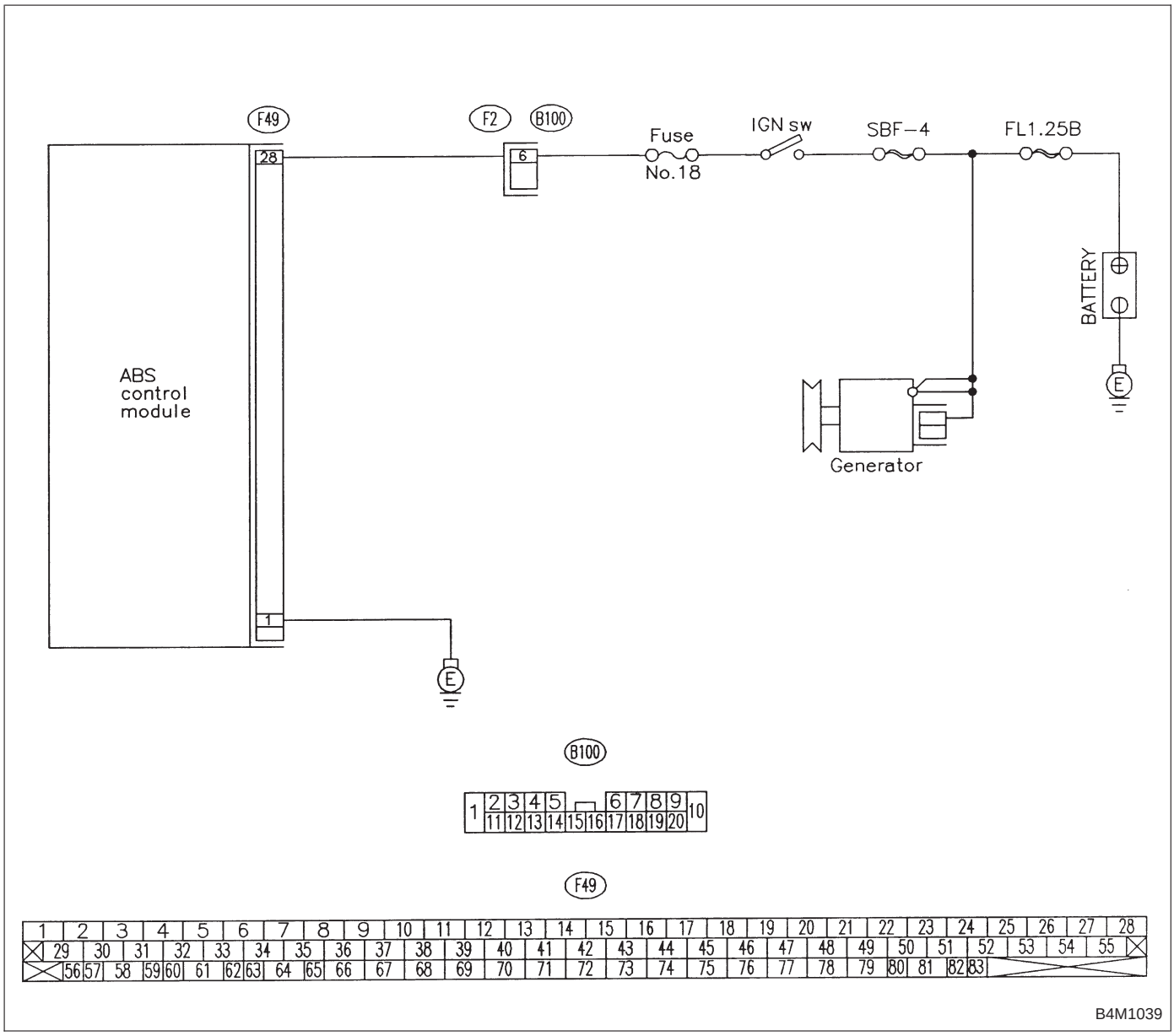
- Power source voltage of the ABSCM is low.

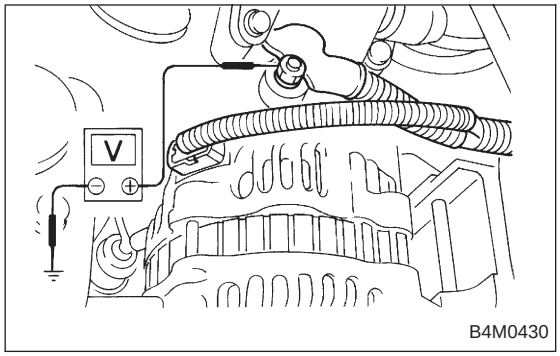
TROUBLE SYMPTOM:

- ABS does not operate.

10W1.	**Check generator.**
10W2.	**Check battery terminal.**
10W3.	**Check input voltage of ABSCM.**
10W4.	**Check ground circuit of ABSCM.**
10W5.	**Check poor contact in connector between generator, battery and ABSCM.**
10W6.	**Check ABSCM.**

WIRING DIAGRAM:





10W1	CHECK GENERATOR.

1) Start engine.
2) Idling after warm-up.
3) Measure voltage between generator B terminal and chassis ground.

CHECK : ***Terminal***
Generator B terminal — Chassis ground
Is voltage 10 — 15 V?

YES : Go to step **10W2.**

NO : Repair generator.

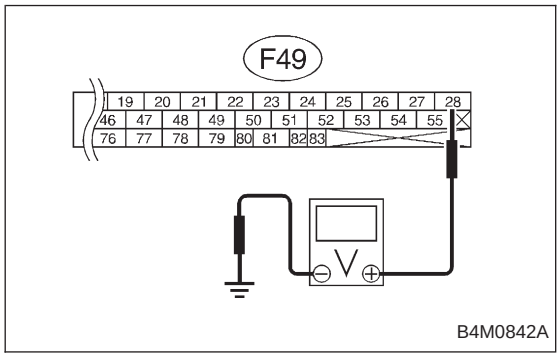
10W2	CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

CHECK : ***Are the positive and negative battery terminals tightly clamped?***

YES : Go to step **10W3.**

NO : Tighten the clamp of terminal.



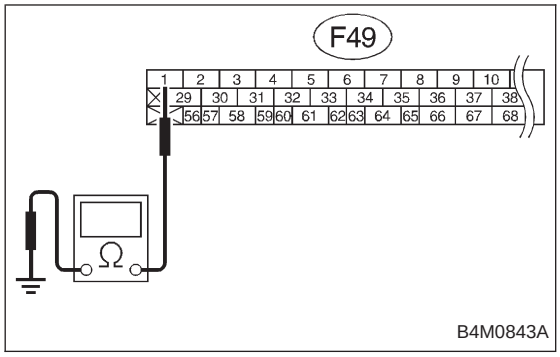
10W3	CHECK INPUT VOLTAGE OF ABSCM.

1) Disconnect connector from ABSCM.
2) Run the engine at idle.
3) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 28 (+) — Chassis ground (−)
Is voltage 10 — 15 V?

YES : Go to step **10W4.**

NO : Repair harness connector between battery, ignition switch and ABSCM.



10W4	CHECK GROUND CIRCUIT OF ABSCM.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal (F49) No. 1 — Chassis ground Is resistance less than 0.5 Ω?***

YES : Go to step **10W5.**

NO : Repair ABSCM ground harness.

10W5	CHECK POOR CONTACT IN CONNECTOR BETWEEN GENERATOR, BATTERY AND ABSCM.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM?***

YES : Repair connector.

NO : Go to step **10W6.**

10W6	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

X: 44 CCM LINE — A COMBINATION OF AT CONTROL ABNORMALS —

DIAGNOSIS:

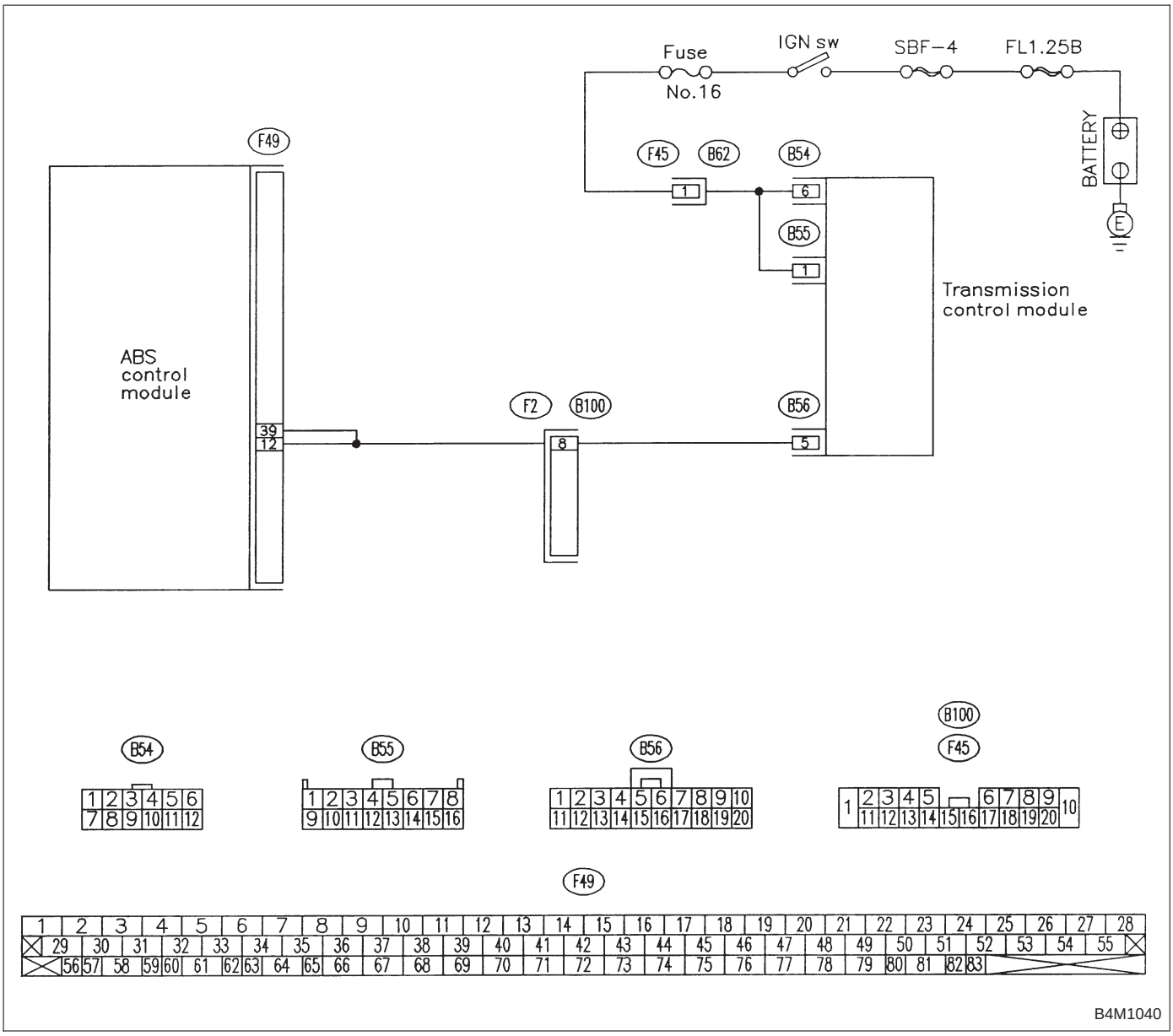
- Combination of AT control faults

TROUBLE SYMPTOM:

- ABS does not operate.

10X1.	**Check specifications of ABSCM using select monitor.**
10X2.	**Check ground short of harness.**
10X3.	**Check AT control module.**
10X4.	**Check open circuit of harness.**
10X5.	**Check poor contact in connector between AT control module and ABSCM.**
10X6.	**Check ABSCM.**

WIRING DIAGRAM:



1996 (F00)
ABS 4WD•AT

B4M0921

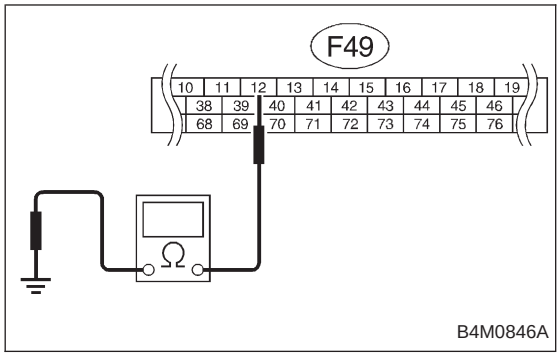
10X1	CHECK SPECIFICATIONS OF ABSCM USING SELECT MONITOR.

1) Press F , 0 and 0 on the select monitor.
2) Read the select monitor display.

CHECK ***: Is an ABSCM for AT model installed on a MT model?***

YES : Replace ABSCM.

NO : Go to step **10X2.**



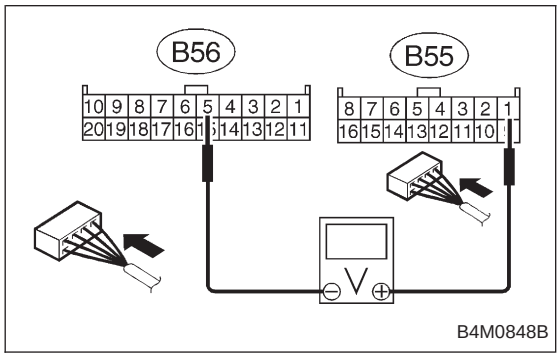
10X2	CHECK GROUND SHORT OF HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect two connectors from AT control module.
3) Disconnect connector from ABSCM.
4) Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 12 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10X3.**

NO : Repair harness between AT control module and ABSCM.



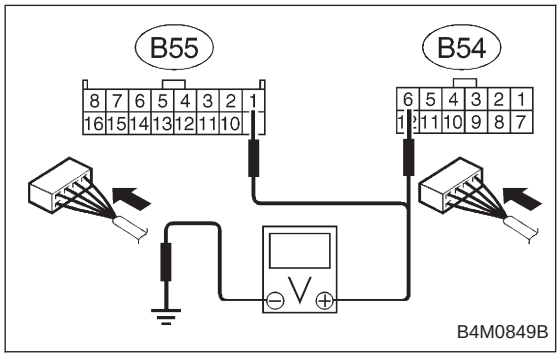
10X3	CHECK AT CONTROL MODULE.

1) Connect all connectors to AT control module.
2) Turn ignition switch to ON.
3) Measure voltage between AT control module connector terminals.

CHECK ***: Connector & terminal***
(B55) No. 1 (+) — (B56) No. 5 (−)
Is voltage 10 — 13 V?

YES : Go to step **10X4.**

NO : Go to next step.

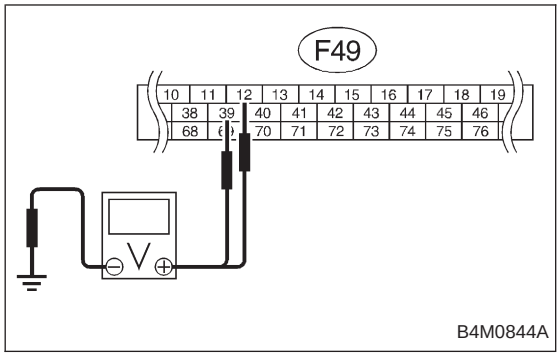


4) Measure voltage between AT control module connector and chassis ground.

CHECK ***: Connector & terminal***
(B54) No. 6 (+) — Chassis ground (−)
(B55) No. 1 (+) — Chassis ground (−)
Is voltage 10 — 13 V?

YES : Replace AT control module.

NO : Repair harness connector between battery, ignition switch and AT control module.



10X4	CHECK OPEN CIRCUIT OF HARNESS.

Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 12 (+) — Chassis ground (−)
(F49) No. 39 (+) — Chassis ground (−)
Is voltage 10 — 13 V?

YES : Go to step **10X5.**

NO : Repair harness connector between AT control module and ABSCM.

10X5	CHECK POOR CONTACT IN CONNECTOR BETWEEN AT CONTROL MODULE AND ABSCM.

CHECK ***: Is there poor contact in connectors between AT control module and ABSCM?***

YES : Repair connector.

NO : Go to step **10X6.**

10X6	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

Y: 44 CCM OPEN — A COMBINATION OF AT CONTROL ABNORMALS —

DIAGNOSIS:

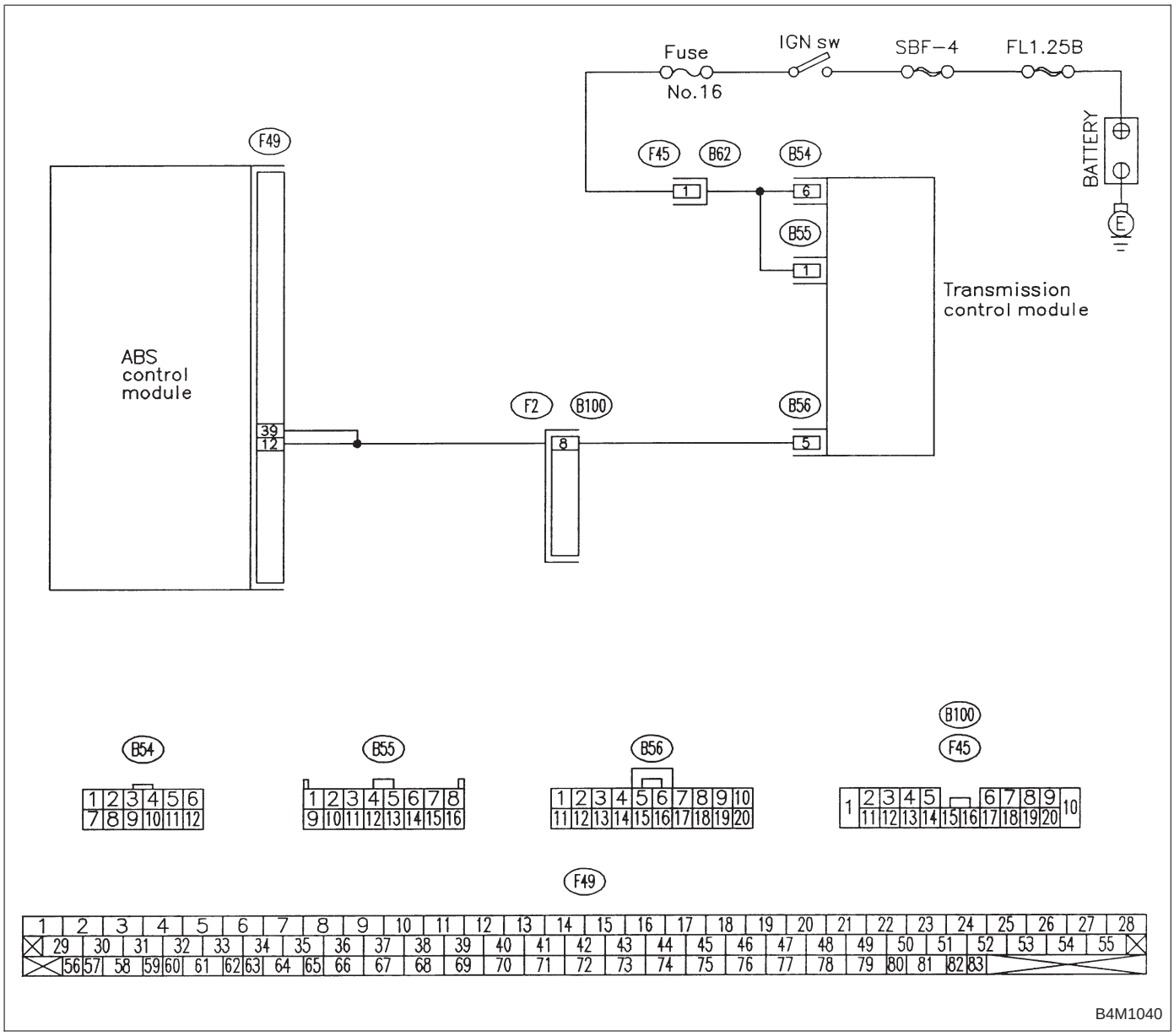
- Combination of AT control faults

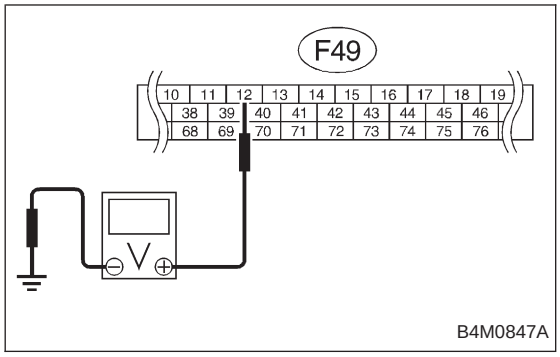
TROUBLE SYMPTOM:

- ABS does not operate.

10Y1.	**Check battery short of harness.**
10Y2.	**Check open circuit of harness.**
10Y3.	**Check poor contact in connector between AT control module and ABSCM.**
10Y4.	**Check ABSCM.**

WIRING DIAGRAM:





10Y1	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect two connectors from AT control module.
3) Disconnect connector from ABSCM.
4) Turn ignition switch to ON.
5) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 12 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

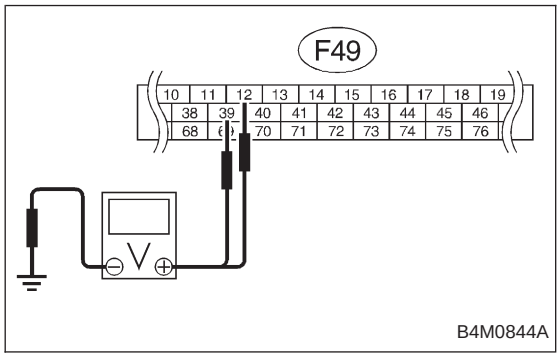
NO : Repair harness between AT control module and ABSCM.

6) Turn ignition switch to OFF.
7) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 12 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10Y2.**

NO : Repair harness between AT control module and ABSCM.



10Y2	CHECK OPEN CIRCUIT OF HARNESS.

1) Connect all connectors to AT control module.
2) Turn ignition switch to ON.
3) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 12 (+) — Chassis ground (−)
(F49) No. 39 (+) — Chassis ground (−)
Is voltage 10 — 13 V?

YES : Go to step **10Y3.**

NO : Repair harness connector between AT control module and ABSCM.

10Y3	**CHECK POOR CONTACT IN CONNECTOR BETWEEN AT CONTROL MODULE AND ABSCM.**

CHECK ***: Is there poor contact in connectors between AT control module and ABSCM?***

YES : Repair connector.

NO : Go to step **10Y4.**

10Y4	**CHECK ABSCM.**

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 46 (FB1)
GS POWER OVER

B4M0966

Z: 46 GS POWER OVER — G SENSOR LINE VOLTAGE TOO HIGH —

DIAGNOSIS:

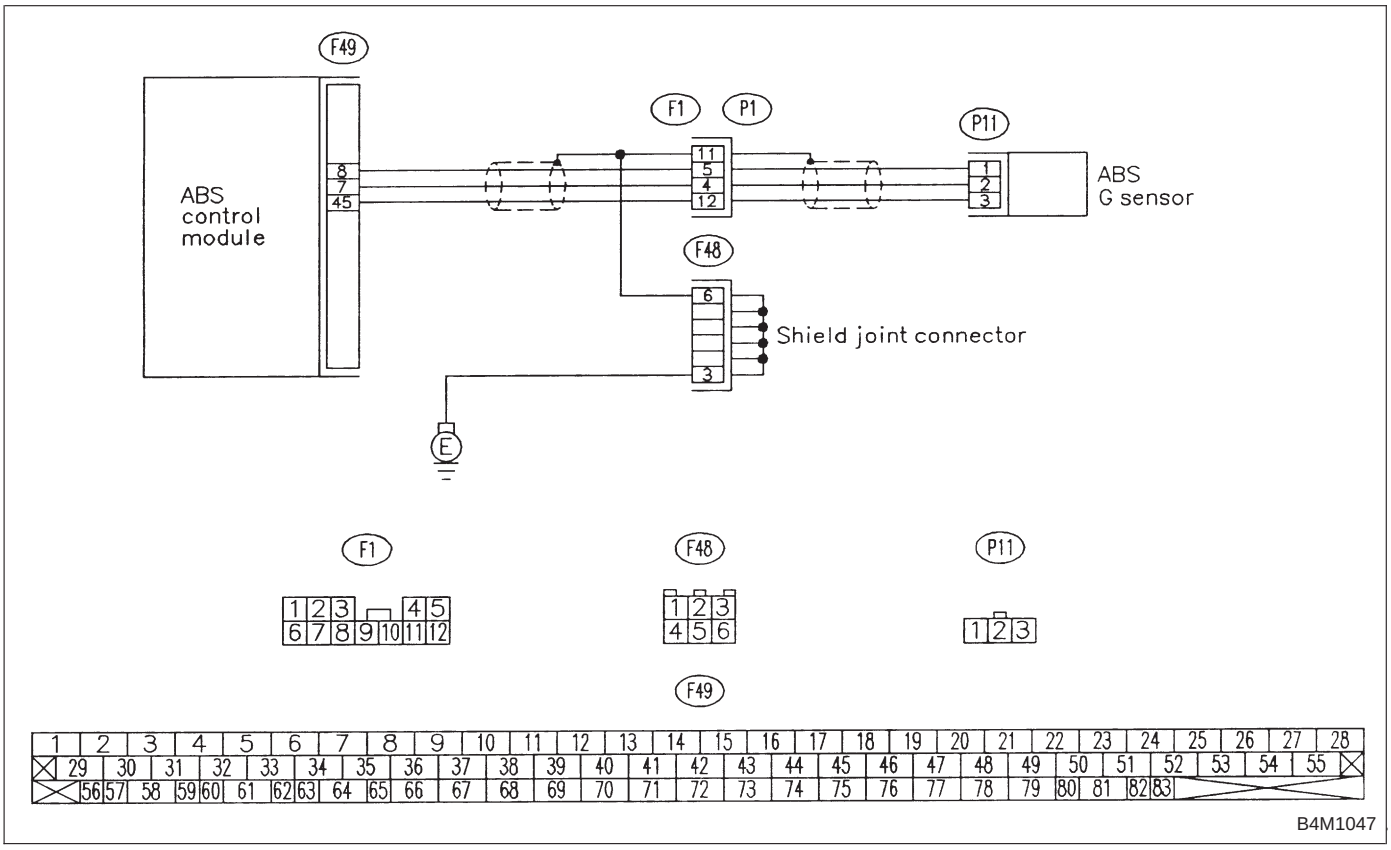
- Faulty G sensor power supply voltage

TROUBLE SYMPTOM:

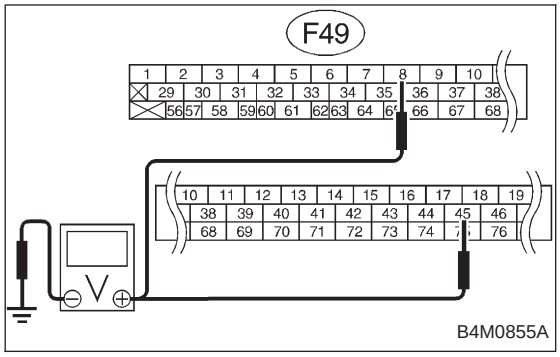
- ABS does not operate.

10Z1.	**Check battery short of harness.**

WIRING DIAGRAM:



B4M1047



10Z1	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to OFF.
2) Remove console cover from console box.
3) Disconnect connector from G sensor.
4) Disconnect connector from ABSCM.
5) Turn ignition switch to ON.
6) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 8 (+) — Chassis ground (−)
(F49) No. 45 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

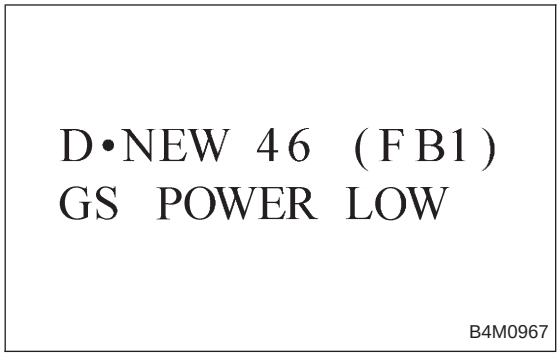
NO : Repair harness between ABSCM and G sensor.

7) Turn ignition switch to OFF.
8) Measure voltage between ABSCM and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 8 (+) — Chassis ground (−)
(F49) No. 45 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Replace ABSCM.

NO : Repair harness between ABSCM and chassis ground.



AA: 46 GS POWER LOW — G SENSOR LINE VOLTAGE TOO LOW —

DIAGNOSIS:

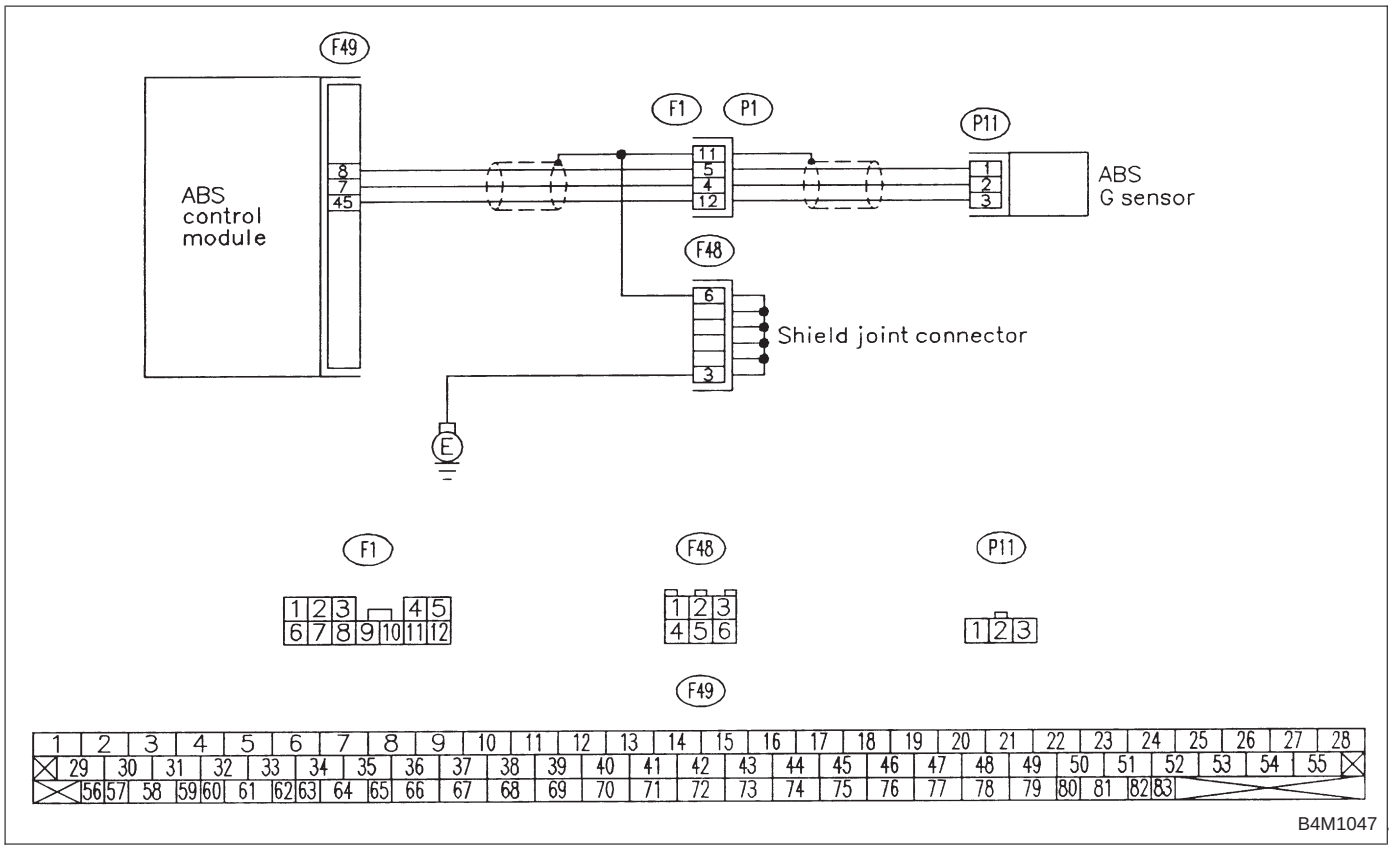
- Faulty G sensor power supply voltage

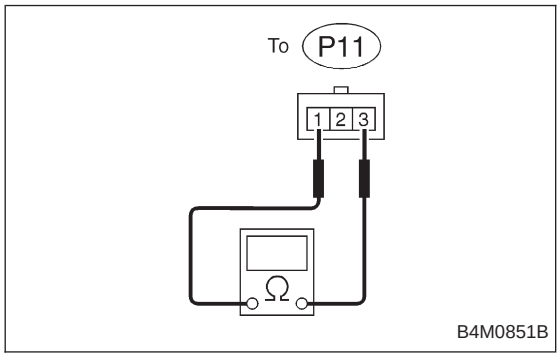
TROUBLE SYMPTOM:

- ABS does not operate.

10AA1.	**Check G sensor.**
10AA2.	**Check ground short of G sensor.**
10AA3.	**Check short of harness between ABSCM and G sensor.**
10AA4.	**Check ground short of harness.**
10AA5.	**Check poor contact in connector between ABSCM and G sensor.**
10AA6.	**Check ABSCM.**

WIRING DIAGRAM:





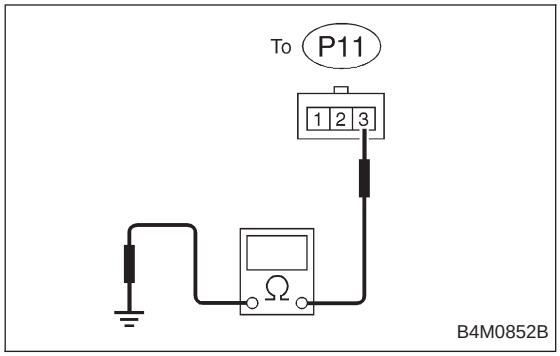
10AA1	CHECK G SENSOR.

1) Turn ignition switch to OFF.
2) Remove console cover from console box.
3) Disconnect connector from G sensor.
4) Measure resistance of G sensor.

CHECK ***: Connector & terminal To (P11) No. 1 — No. 3 Is resistance 50±8 kΩ?***

YES : Go to step **10AA2.**

NO : Replace G sensor.



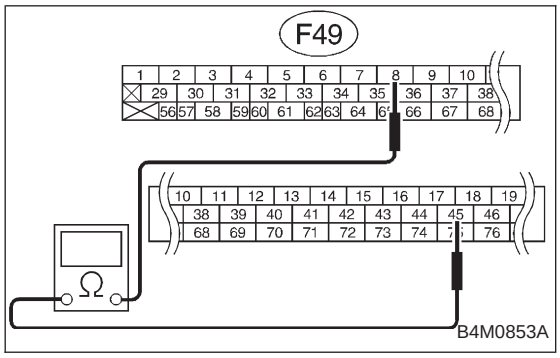
10AA2	CHECK GROUND SHORT OF G SENSOR.

Measure resistance between G sensor and bracket.

CHECK : ***Connector & terminal***
To (P11) No. 3 — Bracket
Is resistance more than 1 MΩ?

YES : Go to step **10AA3.**

NO : Replace G sensor.



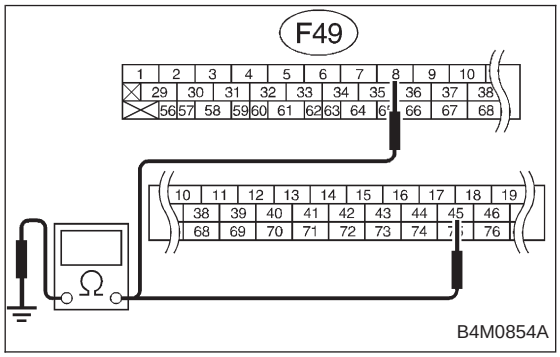
10AA3	CHECK SHORT OF HARNESS BETWEEN ABSCM AND G SENSOR.

1) Disconnect connector from ABSCM.
2) Measure resistance between ABSCM connector terminals.

CHECK : ***Connector & terminal***
(F49) No. 45 — No. 8
Is resistance more than 1 MΩ?

YES : Go to step **10AA4.**

NO : Repair harness between ABSCM and G sensor.



10AA4	CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 8 — Chassis ground
(F49) No. 45 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10AA5.**

NO : Repair harness between ABSCM and G sensor.

10AA5	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.

CHECK : ***Is there poor contact in connectors between ABSCM and G sensor?***

YES : Repair connector.

NO : Go to step **10AA6.**

10AA6	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

AB: 51 V. RELAY
— ABNORMAL VALVE RELAY —

DIAGNOSIS:

- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

10AB1.	Check freeze frame data.
10AB2.	Check resistance of valve relay.
10AB3.	Check contact point of valve relay.
10AB4.	Check short of valve relay.
10AB5.	Check power supply voltage at valve relay contact point.
10AB6.	Check broken wire and ground short in power supply circuit of relay box.
10AB7.	Check broken wire in contact point circuit of relay box.
10AB8.	Check ground short in contact point circuit of relay box.
10AB9.	Check diode of relay box.
10AB10.	Check battery short in ground circuit of relay box.
10AB11.	Check broken wire in control circuit of relay box.
10AB12.	Check ground short in control circuit of relay box.
10AB13.	Check battery short in control circuit of relay box.

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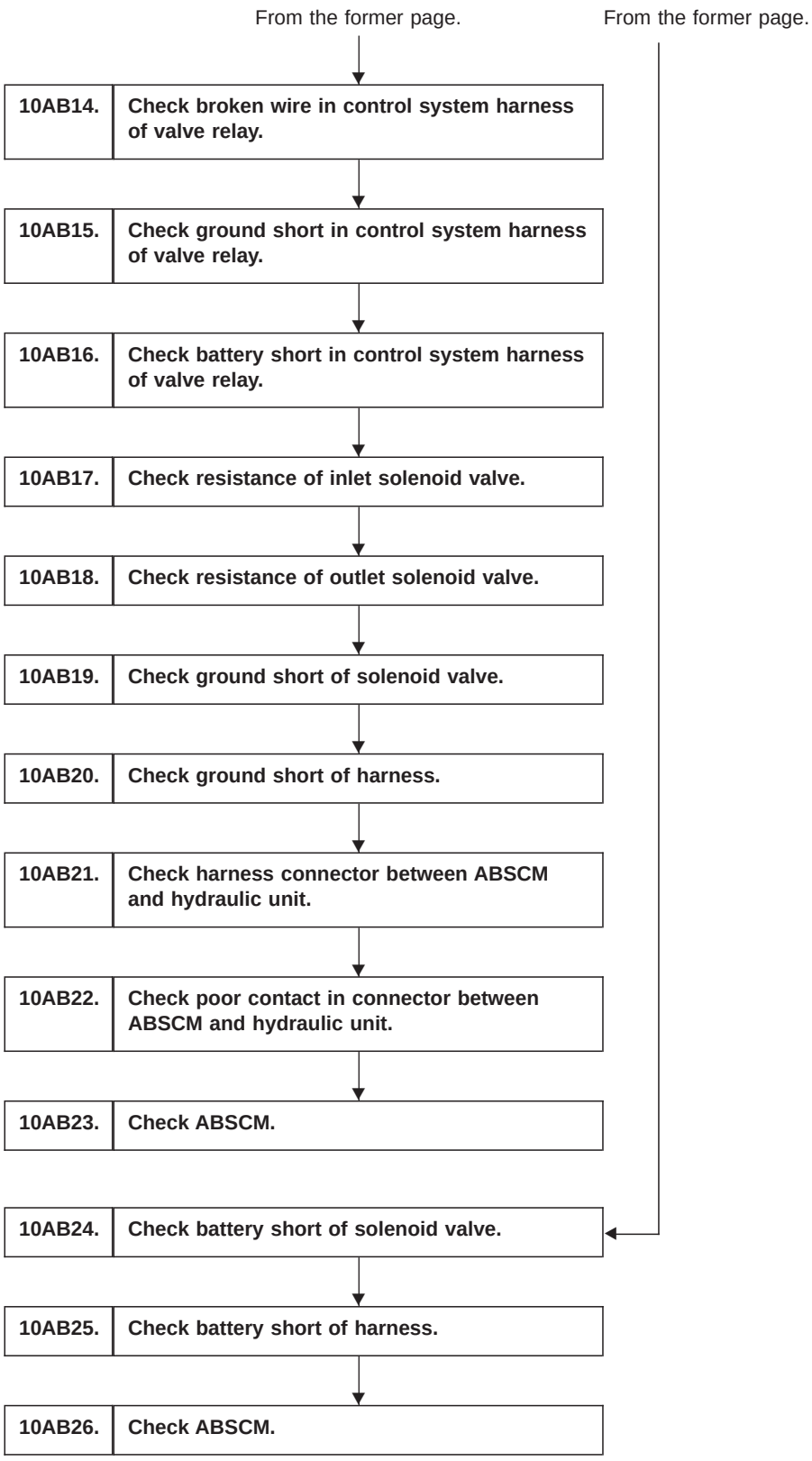
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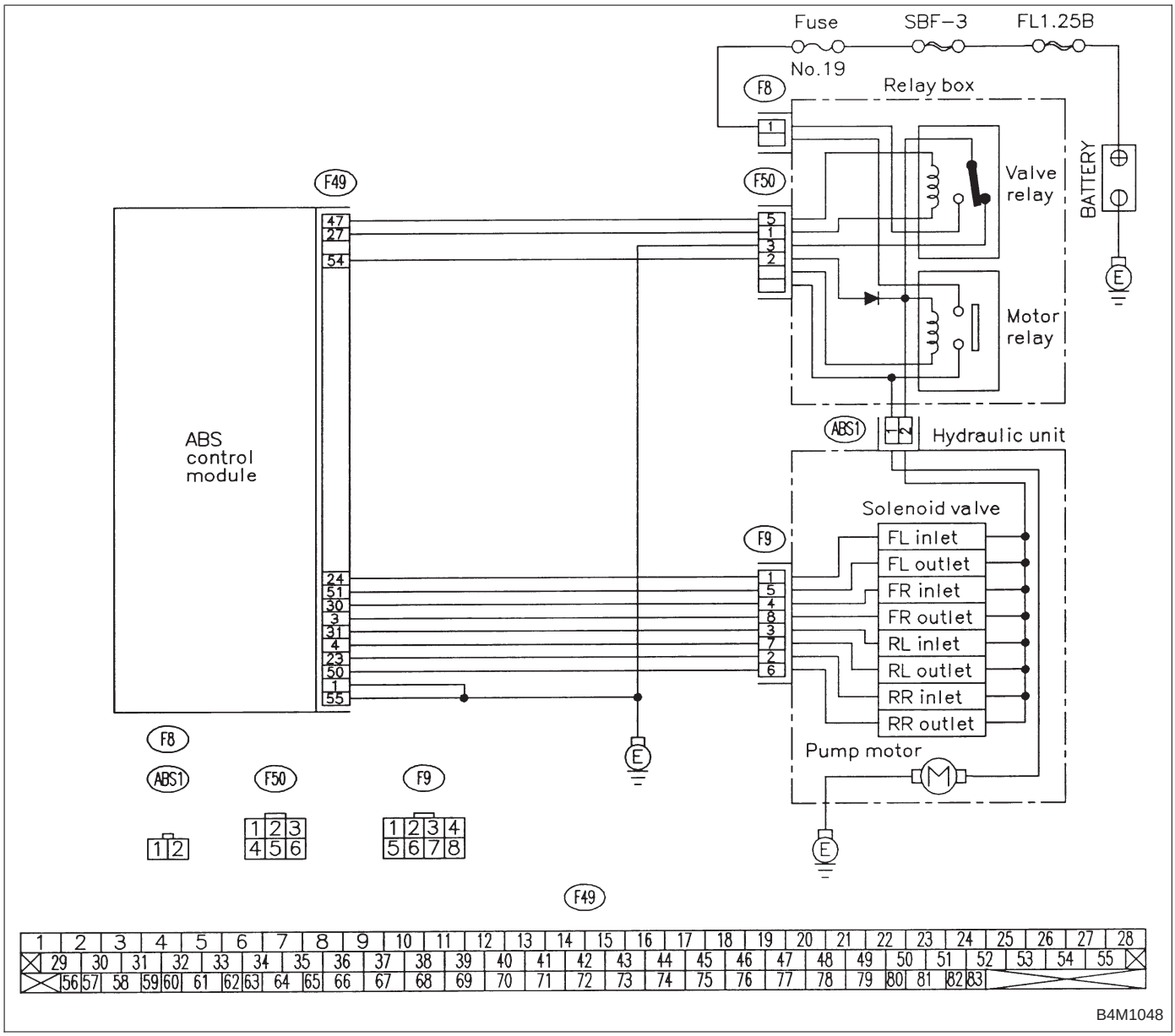
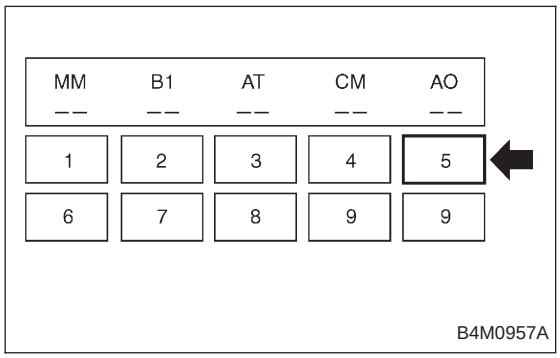
From the former page.
10AB14.
Check broken wire in control system harness of valve relay.
10AB15.
Check ground short in control system harness of valve relay.
10AB16.
Check battery short in control system harness of valve relay.
10AB17.
Check resistance of inlet solenoid valve.
10AB18.
Check resistance of outlet solenoid valve.
10AB19.
Check ground short of solenoid valve.
10AB20.
Check ground short of harness.
10AB21.
Check harness connector between ABSCM and hydraulic unit.
10AB22.
Check poor contact in connector between ABSCM and hydraulic unit.
10AB23.
Check ABSCM.
10AB24.
Check battery short of solenoid valve.
10AB25.
Check battery short of harness.
10AB26.
Check ABSCM.

WIRING DIAGRAM:





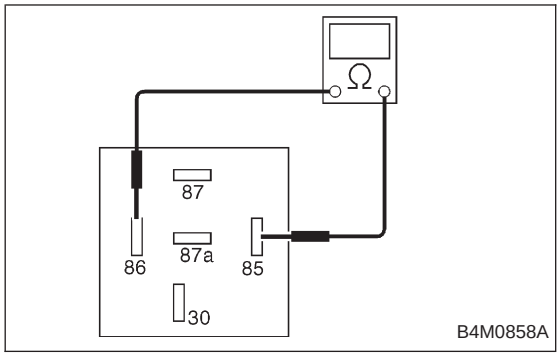
10AB1	CHECK FREEZE FRAME DATA.

Press F , E , 1 and 5 on the select monitor.

CHECK ***: Is the select monitor LED 5 off? Was the ABS inactive when the problem occurred?***

YES : Go to step **10AB2.**

NO : Go to step **10AB24.**



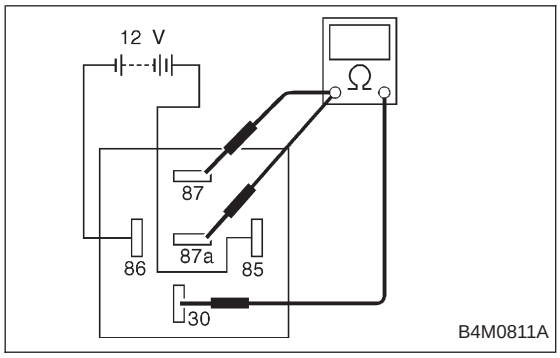
10AB2	CHECK RESISTANCE OF VALVE RELAY.

1) Turn ignition switch to OFF.
2) Remove valve relay from relay box.
3) Measure resistance between valve relay terminals.

CHECK : ***Terminals***
No. 85 — No. 86
Is resistance 103±10 Ω?

YES : Go to step **10AB3.**

NO : Replace valve relay.



10AB3	CHECK CONTACT POINT OF VALVE RELAY.

1) Connect battery to valve relay terminals No. 85 and No. 86.
2) Measure resistance between valve relay terminals.

CHECK : ***Terminals***
No. 30 — No. 87
Is resistance less than 0.5 Ω?

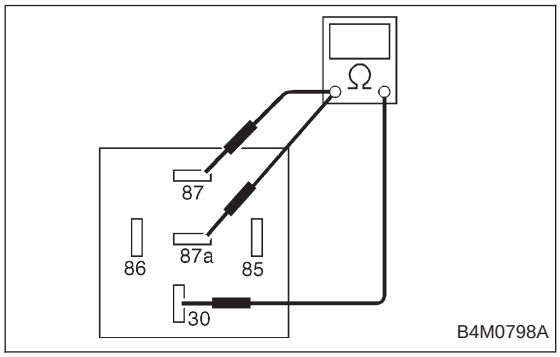
YES : Go to next CHECK .

NO : Replace valve relay.

CHECK : ***Terminals***
No. 30 — No. 87a
Is resistance more than 1 MΩ?

YES : Go to next step.

NO : Replace valve relay.



3) Disconnect battery from valve relay terminals.
4) Measure resistance between valve relay terminals.

CHECK : ***Terminals***
No. 30 — No. 87
Is resistance more than 1 MΩ?

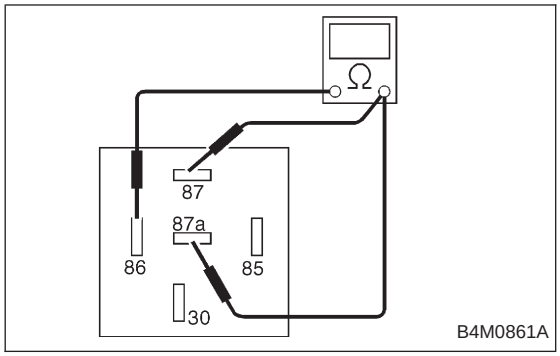
YES : Go to next CHECK .

NO : Replace valve relay.

CHECK : ***Terminals***
No. 30 — No. 87a
Is resistance less than 0.5 Ω?

YES : Go to step **10AB4.**

NO : Replace valve relay.



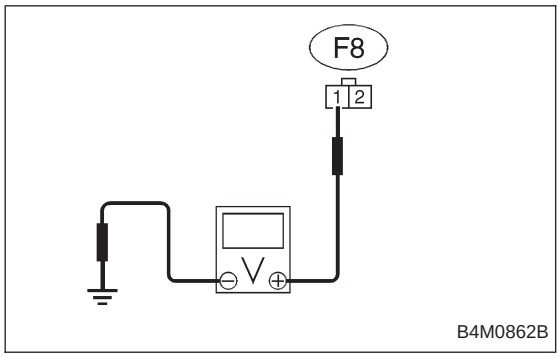
10AB4	CHECK SHORT OF VALVE RELAY.

Measure resistance between valve relay terminals.

CHECK : ***Terminals***
No. 86 — No. 87
No. 86 — No. 87a
Is resistance more than 1 MΩ?

YES : Go to step **10AB5.**

NO : Replace valve relay.



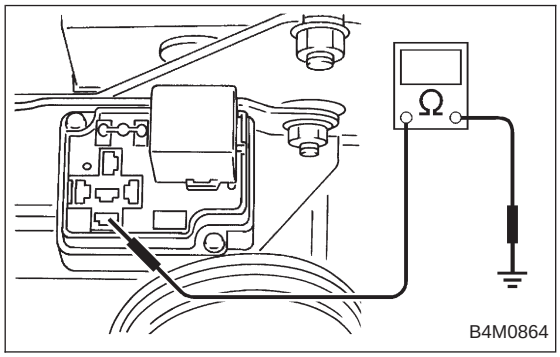
10AB5	CHECK POWER SUPPLY VOLTAGE AT VALVE RELAY CONTACT POINT.

1) Disconnect connector (F8) from relay box.
2) Measure voltage between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
(F8) No. 1 (+) — Chassis ground (−)
Is voltage 10 — 13 V?

YES : Go to step **10AB6.**

NO : Repair harness connector between battery and relay box. Check fuse No. 19.



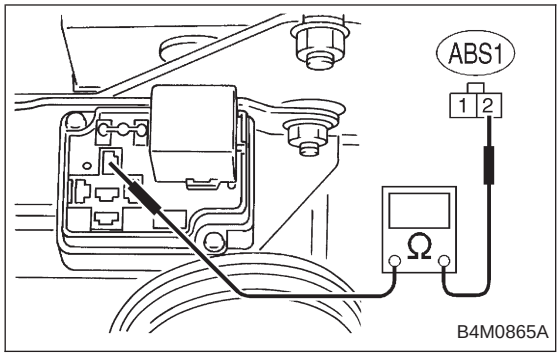
10AB6	CHECK BROKEN WIRE AND GROUND SHORT IN POWER SUPPLY CIRCUIT OF RELAY BOX.

1) Disconnect connector (ABS1) from hydraulic unit.
2) Connect connector (F8) to relay box.
3) Disconnect connector (F50) from relay box.
4) Measure voltage of relay box.

CHECK : ***Connector & terminal***
Valve relay installing point No. 87 — Chassis ground
Is voltage 10 — 13 V?

YES : Go to step **10AB7.**

NO : Replace relay box. Check fuse No. 19.



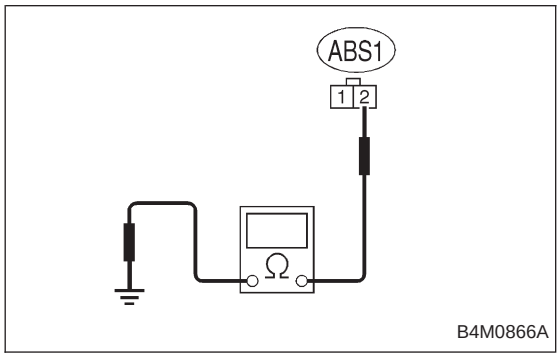
10AB7	CHECK BROKEN WIRE IN CONTACT POINT CIRCUIT OF RELAY BOX.

Measure resistance between hydraulic unit connector and valve relay installing point.

CHECK : ***Connector & terminal***
(ABS1) No. 2 — Valve relay installing point No. 30
Is resistance less than 0.5 Ω?

YES : Go to step **10AB8.**

NO : Replace relay box.



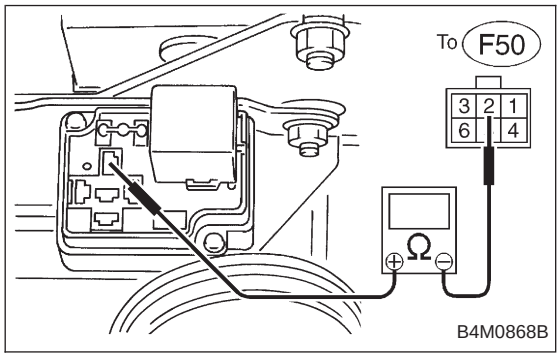
10AB8	CHECK GROUND SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.

Measure resistance between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
(ABS1) No. 2 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10AB9.**

NO : Replace relay box. Check fuse SBF6.



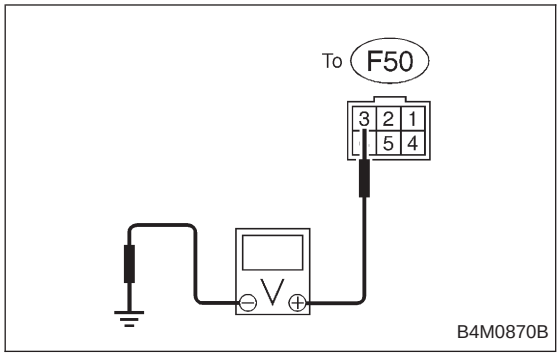
10AB9	CHECK DIODE OF RELAY BOX.

Measure resistance between relay box connector and valve relay installing point.

CHECK : ***Connector & terminal***
Valve relay installing point No. 30 (+) — To (F50) No. 2 (−)
Is resistance more than 1 MΩ?

YES : Go to step **10AB10.**

NO : Replace relay box.



10AB10	CHECK BATTERY SHORT IN GROUND CIRCUIT OF RELAY BOX.

1) Disconnect connector from ABSCM.
2) Turn ignition switch to ON.
3) Measure voltage between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
To (F50) No. 3 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

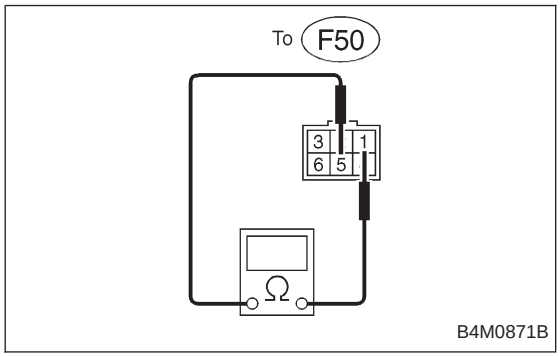
NO : Replace relay box and check all fuses.

4) Turn ignition switch to OFF.
5) Measure voltage between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
To (F50) No. 3 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10AB11.**

NO : Replace relay box and check all fuses.



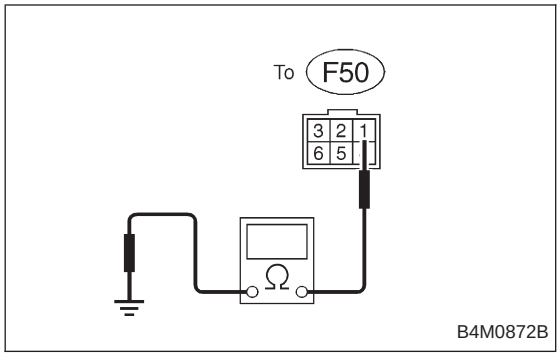
10AB11	CHECK BROKEN WIRE IN CONTROL CIRCUIT OF RELAY BOX.

1) Install valve relay to relay box.
2) Measure resistance between relay box connector terminals.

CHECK : ***Connector & terminal***
To (F50) No. 1 — No. 5
Is resistance 103±10 Ω?

YES : Go to step **10AB12.**

NO : Replace relay box.



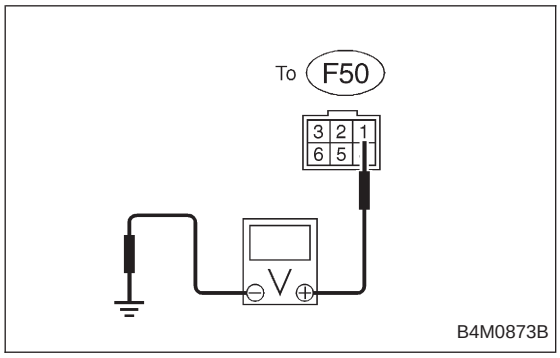
10AB12	CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.

Measure resistance between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
To (F50) No. 1 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10AB13.**

NO : Replace relay box and check all fuses.



10AB13	CHECK BATTERY SHORT IN CONTROL CIRCUIT OF RELAY BOX.

1) Turn ignition switch to ON.
2) Measure voltage between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
To (F50) No. 1 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

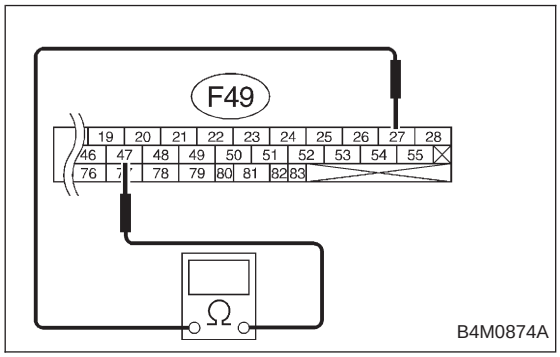
NO : Replace relay box. Check fuse No. 19 and SBF6.

3) Turn ignition switch to OFF.
4) Measure voltage between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
To (F50) No. 1 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10AB14.**

NO : Replace relay box. Check fuse No. 19 and SBF6.



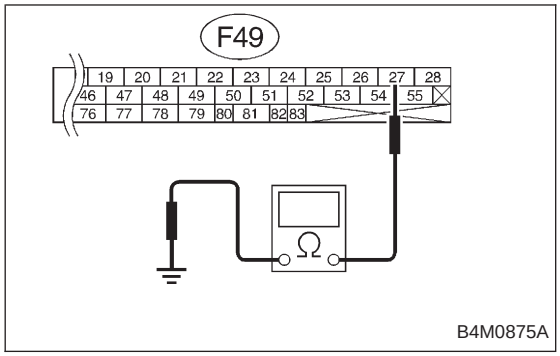
10AB14	CHECK BROKEN WIRE IN CONTROL SYSTEM HARNESS OF VALVE RELAY.

1) Connect connector (F50) to relay box.
2) Measure resistance between ABSCM connector terminals.

CHECK : ***Connector & terminal***
(F49) No. 27 — No. 47
Is resistance 103±10 Ω?

YES : Go to step **10AB15.**

NO : Repair harness between ABSCM and relay box. Check fuse No. 18.



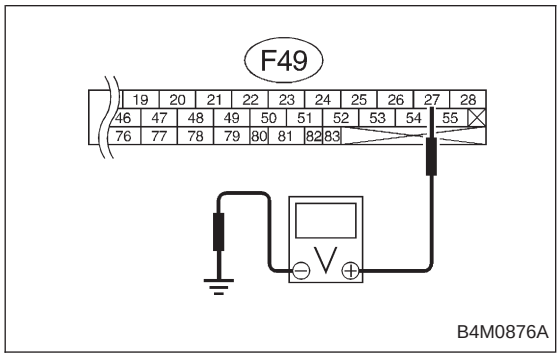
10AB15	CHECK GROUND SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.

1) Disconnect connector (F50) from relay box.
2) Measure resistance between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 27 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10AB16.**

NO : Repair harness between ABSCM and relay box. Check fuse No. 18.



10AB16	CHECK BATTERY SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.

1) Connect connector (F50) to relay box.
2) Turn ignition switch to ON.
3) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 27 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

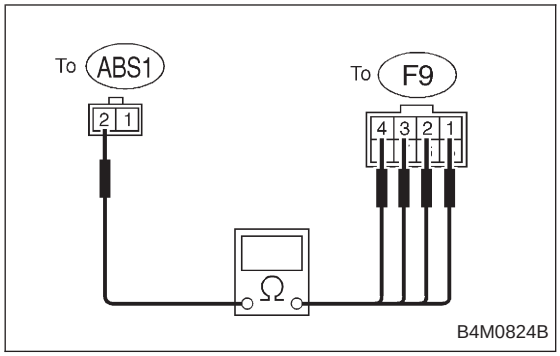
NO : Repair harness between ABSCM and relay box and check all fuses.

4) Turn ignition switch to OFF.
5) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 27 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10AB17.**

NO : Repair harness between ABSCM and relay box and check all fuses.



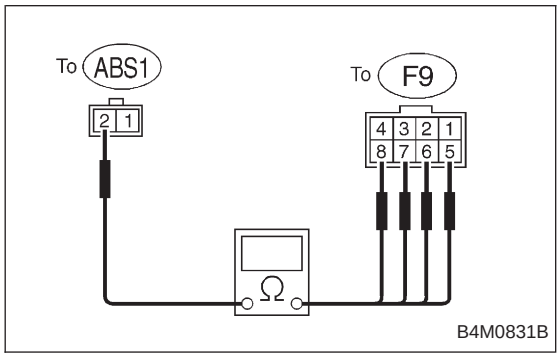
10AB17	CHECK RESISTANCE OF INLET SOLENOID VALVE.

1) Disconnect connector from hydraulic unit.
2) Measure resistance between hydraulic unit connector terminals.

CHECK ***: Connector & terminal***
To (F9) No. 4 — to (ABS1) No. 2
To (F9) No. 1 — to (ABS1) No. 2
To (F9) No. 2 — to (ABS1) No. 2
To (F9) No. 3 — to (ABS1) No. 2
Is resistance 8.5±0.7 Ω?

YES : Go to step **10AB18.**

NO : Replace hydraulic unit.



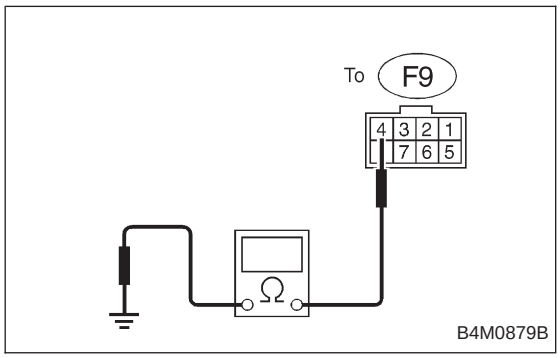
10AB18	CHECK RESISTANCE OF OUTLET SOLENOID VALVE.

Measure resistance between hydraulic unit connector terminals.

CHECK ***: Connector & terminal***
To (F9) No. 8 — to (ABS1) No. 2
To (F9) No. 5 — to (ABS1) No. 2
To (F9) No. 6 — to (ABS1) No. 2
To (F9) No. 7 — to (ABS1) No. 2
Is resistance 4.3±0.5 Ω?

YES : Go to step **10AB19.**

NO : Replace hydraulic unit.



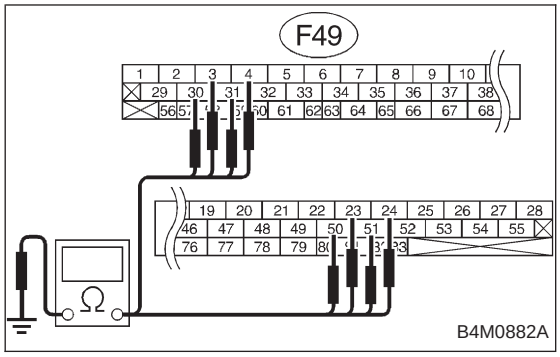
10AB19	CHECK GROUND SHORT OF SOLENOID VALVE.

Measure resistance between hydraulic unit connector and chassis ground.

CHECK ***: Connector & terminal***
To (F9) No. 4 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10AB20.**

NO : Replace hydraulic unit and check all fuses.



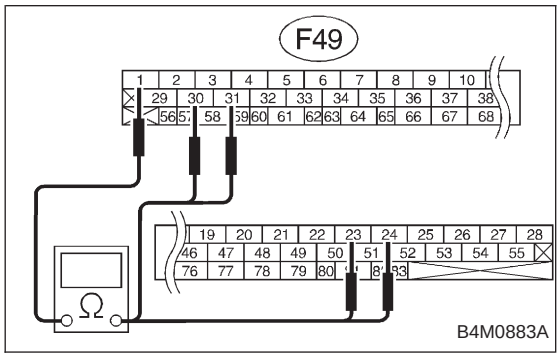
10AB20	CHECK GROUND SHORT OF HARNESS.

1) Disconnect connector from hydraulic unit.
2) Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 30 — Chassis ground
(F49) No. 24 — Chassis ground
(F49) No. 23 — Chassis ground
(F49) No. 31 — Chassis ground
(F49) No. 3 — Chassis ground
(F49) No. 51 — Chassis ground
(F49) No. 50 — Chassis ground
(F49) No. 4 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10AB21.**

NO : Repair harness between hydraulic unit and ABSCM.



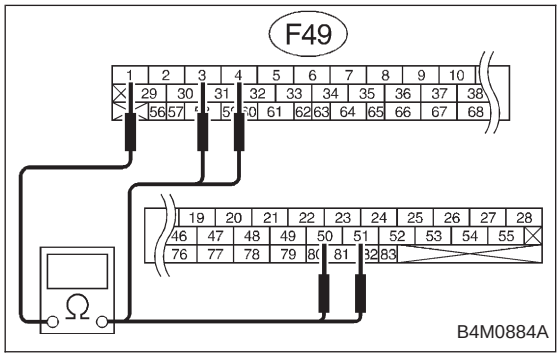
10AB21	CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

1) Connect connector to hydraulic unit.
2) Measure resistance between ABSCM connector terminals.

CHECK ***: Connector & terminal***
(F49) No. 30 — No. 1
(F49) No. 24 — No. 1
(F49) No. 23 — No. 1
(F49) No. 31 — No. 1
Is resistance 9.0±0.7 Ω?

YES : Go to next CHECK .

NO : Repair harness connector between hydraulic unit and ABSCM.



CHECK ***: Connector & terminal***
(F49) No. 3 — No. 1
(F49) No. 51 — No. 1
(F49) No. 50 — No. 1
(F49) No. 4 — No. 1
Is resistance 4.8±0.5 Ω?

YES : Go to step **10AB22.**

NO : Repair harness connector between hydraulic unit and ABSCM.

10AB22	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

CHECK : ***Is there poor contact in connector between ABSCM and hydraulic unit?***

YES : Repair connector.

NO : Go to step **10AB23.**

10AB23	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

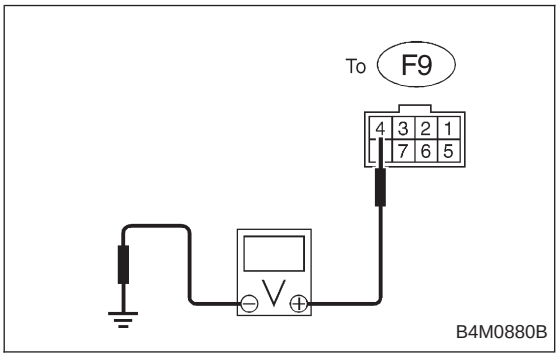
YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



10AB24	CHECK BATTERY SHORT OF SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Disconnect connectors (ABS1, F9) from hydraulic unit.
3) Disconnect connector from ABSCM.
4) Turn ignition switch to ON.
5) Measure voltage between hydraulic unit connector and chassis ground.

CHECK : ***Connector & terminal***
To (F9) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

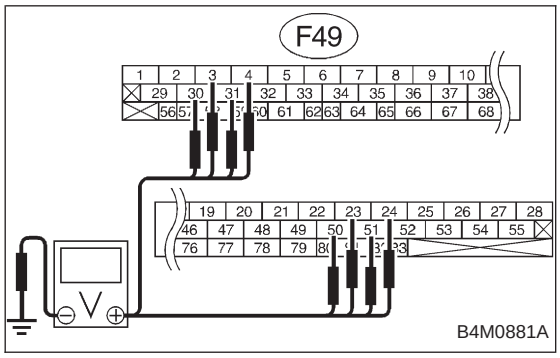
NO : Replace hydraulic unit and check all fuses.

6) Turn ignition switch to OFF.
7) Measure voltage between hydraulic unit connector and chassis ground.

CHECK : ***Connector & terminal***
To (F63) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10AB25.**

NO : Replace hydraulic unit and check all fuses.



10AB25 CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 30 (+) — Chassis ground (−)
(F49) No. 24 (+) — Chassis ground (−)
(F49) No. 23 (+) — Chassis ground (−)
(F49) No. 31 (+) — Chassis ground (−)
(F49) No. 3 (+) — Chassis ground (−)
(F49) No. 51 (+) — Chassis ground (−)
(F49) No. 50 (+) — Chassis ground (−)
(F49) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

NO : Repair harness between hydraulic unit and ABSCM and check all fuses.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 30 (+) — Chassis ground (−)
(F49) No. 24 (+) — Chassis ground (−)
(F49) No. 23 (+) — Chassis ground (−)
(F49) No. 31 (+) — Chassis ground (−)
(F49) No. 3 (+) — Chassis ground (−)
(F49) No. 51 (+) — Chassis ground (−)
(F49) No. 50 (+) — Chassis ground (−)
(F49) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10AB26.**

NO : Repair harness between hydraulic unit and ABSCM and check all fuses.

10AB26	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

AC: 51 V. RELAY ON — VALVE RELAY ON FAILURE —

DIAGNOSIS:

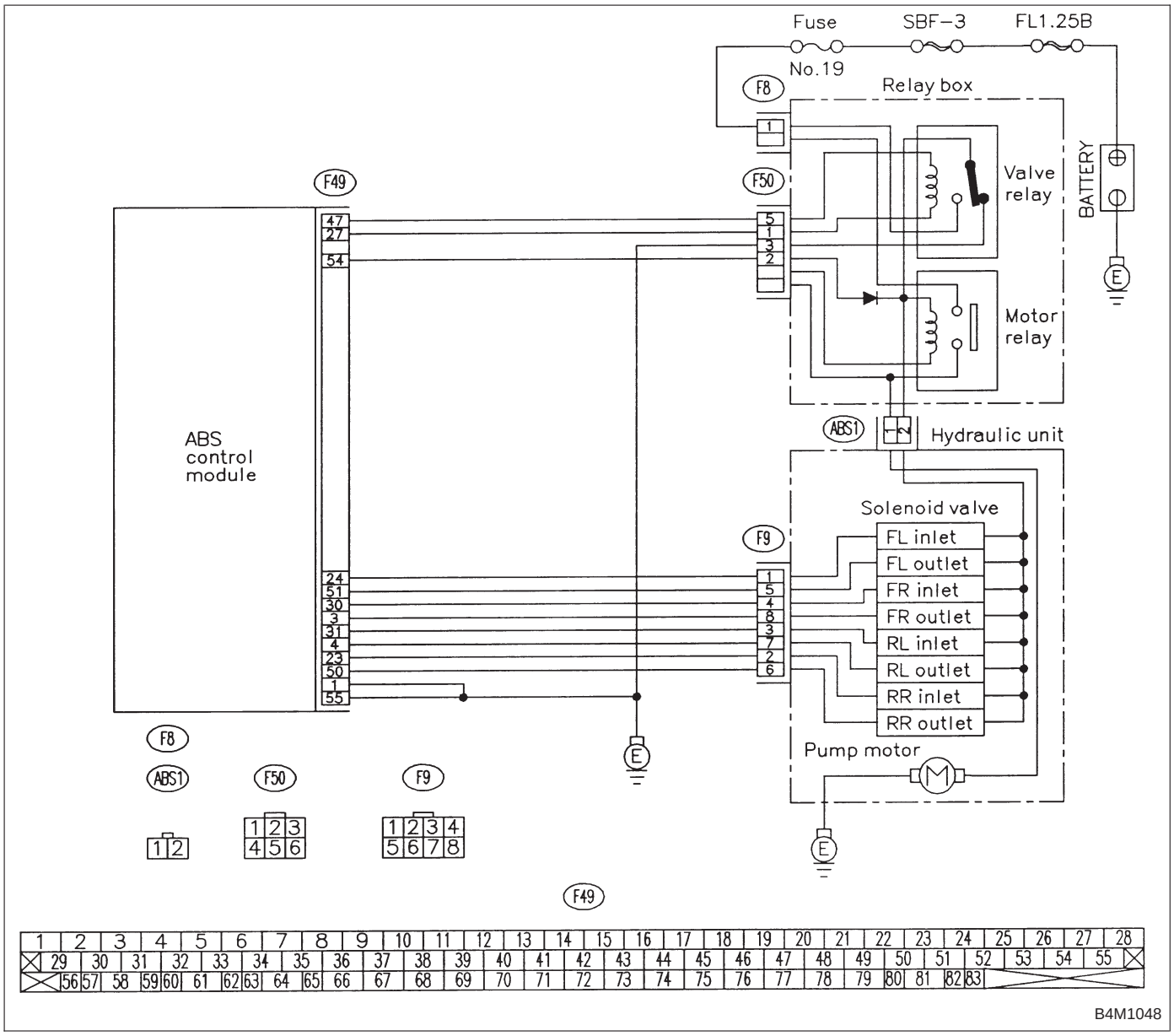
- Faulty valve relay

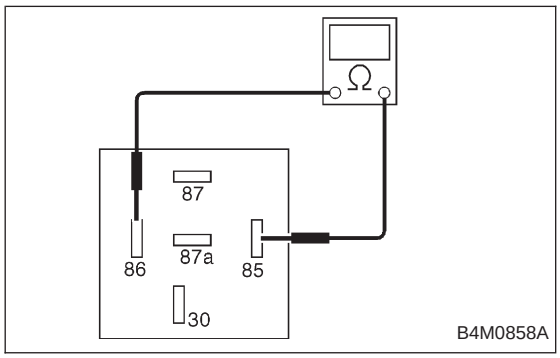
TROUBLE SYMPTOM:

- ABS does not operate.

10AC1.	**Check resistance of valve relay.**
10AC2.	**Check contact point of valve relay.**
10AC3.	**Check ground circuit of relay box.**
10AC4.	**Check battery short in contact point circuit of relay box.**
10AC5.	**Check broken wire in ground circuit of relay box.**
10AC6.	**Check ground short in control circuit of relay box.**
10AC7.	**Check ground short in control system harness of valve relay.**
10AC8.	**Check battery short of solenoid valve.**
10AC9.	**Check battery short of harness.**
10AC10.	**Check poor contact in connector between ABSCM and hydraulic unit.**
10AC11.	**Check ABSCM.**

WIRING DIAGRAM:





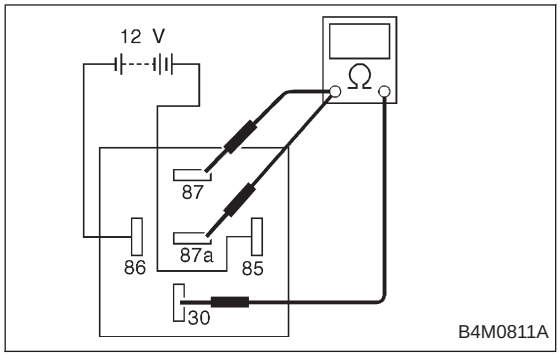
10AC1	CHECK RESISTANCE OF VALVE RELAY.

1) Turn ignition switch to OFF.
2) Remove valve relay from relay box.
3) Measure resistance between valve relay terminals.

CHECK : ***Terminals***
No. 85 — No. 86
Is resistance 103±10 Ω?

YES : Go to step **10AC2.**

NO : Replace valve relay.



10AC2	CHECK CONTACT POINT OF VALVE RELAY.

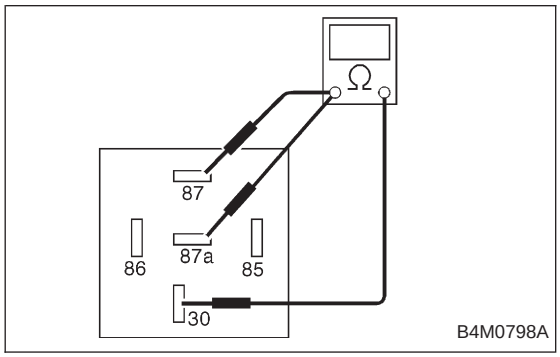
1) Connect battery to valve relay terminals No. 85 and No. 86.
2) Measure resistance between valve relay terminals.

CHECK ***: Terminals***
No. 30 — No. 87
Is resistance less than 0.5 Ω?

YES : Go to next CHECK .
NO : Replace valve relay.

CHECK ***: Terminals***
No. 30 — No. 87a
Is resistance more than 1 MΩ?

YES : Go to next step.
NO : Replace valve relay.



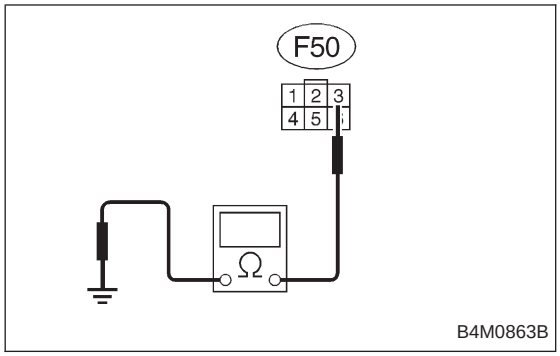
3) Disconnect battery from valve relay terminals.
4) Measure resistance between valve relay terminals.

CHECK ***: Terminals***
No. 30 — No. 87
Is resistance more than 1 MΩ?

YES : Go to next CHECK .
NO : Replace valve relay.

CHECK ***: Terminals***
No. 30 — No. 87a
Is resistance less than 0.5 Ω?

YES : Go to step **10AC3.**
NO : Replace valve relay.



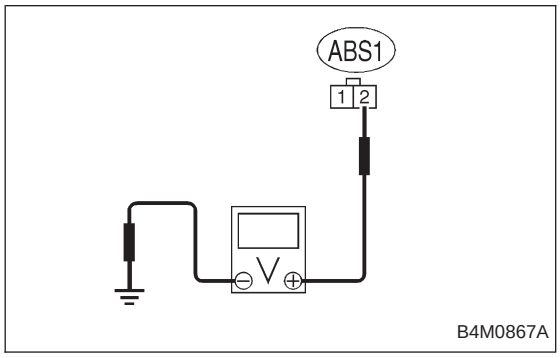
10AC3	CHECK GROUND CIRCUIT OF RELAY BOX.

1) Disconnect connector (F50) from relay box.
2) Measure resistance between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
(F50) No. 3 — Chassis ground
Is resistance less than 0.5 Ω?

YES : Go to step **10AC4.**

NO : Repair relay box ground harness.



10AC4	CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.

1) Disconnect connector from ABSCM.
2) Disconnect connector (ABS1) from hydraulic unit.
3) Turn ignition switch to ON.
4) Measure voltage between hydraulic unit connector and chassis ground.

CHECK : ***Connector & terminal***
(ABS1) No. 2 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

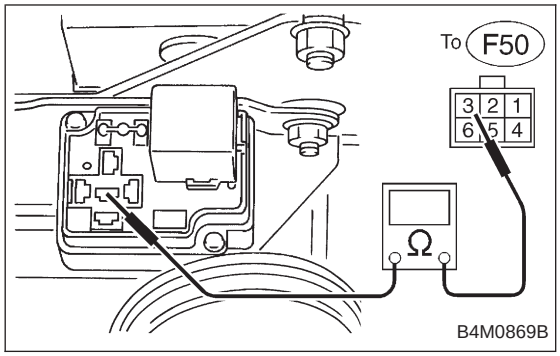
NO : Replace relay box. Check fuse No. 19 and SBF6.

5) Turn ignition switch to OFF.
6) Measure voltage between hydraulic unit connector and chassis ground.

CHECK : ***Connector & terminal***
(ABS1) No. 2 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10AC5.**

NO : Replace relay box. Check fuse No. 9 and SBF6.



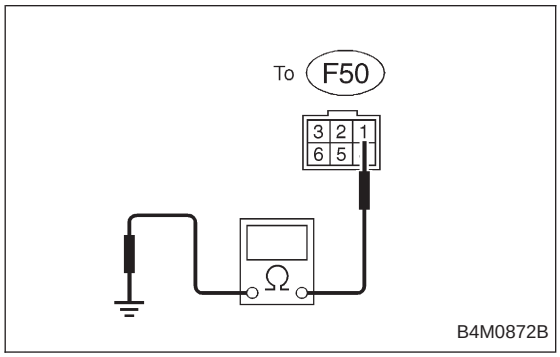
10AC5	CHECK BROKEN WIRE IN GROUND CIRCUIT OF RELAY BOX.

Measure resistance between relay box connector and valve relay installing point.

CHECK : ***Connector & terminal***
To (F50) No. 3 — Valve relay installing point No. 87a
Is resistance less than 0.5 Ω?

YES : Go to step **10AC6.**

NO : Replace relay box.



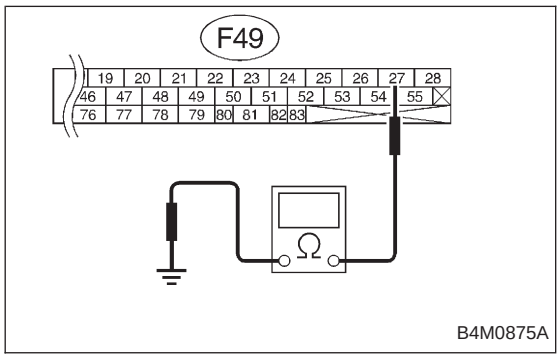
10AC6	CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.

1) Install valve relay to relay box.
2) Measure resistance between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
To (F50) No. 1 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10AC7.**

NO : Replace relay box and check all fuses.



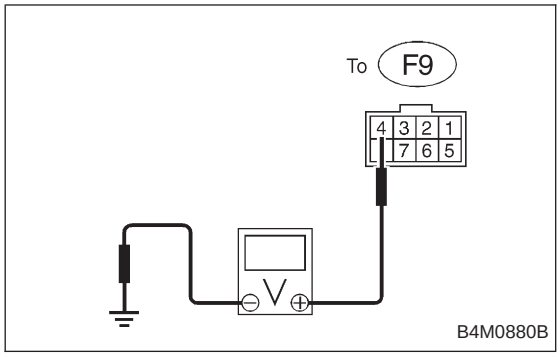
10AC7	CHECK GROUND SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.

Measure resistance between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 27 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10AC8.**

NO : Repair harness between ABSCM and relay box. Check fuse No. 18.



10AC8	CHECK BATTERY SHORT OF SOLENOID VALVE.

1) Disconnect connector (ABS1, F9) from hydraulic unit.
2) Turn ignition switch to ON.
3) Measure voltage between hydraulic unit connector and chassis ground.

CHECK : ***Connector & terminal***
To (F63) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

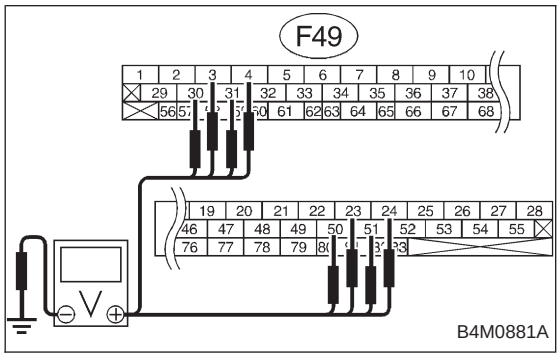
NO : Replace hydraulic unit and check all fuses.

4) Turn ignition switch to OFF.
5) Measure voltage between hydraulic unit connector and chassis ground.

CHECK : ***Connector & terminal***
To (F63) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10AC9.**

NO : Replace hydraulic unit and check all fuses.



10AC9	CHECK BATTERY SHORT OF HARNESS.

1) Disconnect connector from hydraulic unit.
2) Turn ignition switch to ON.
3) Measure voltage between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 30 (+) — Chassis ground (−)
(F49) No. 24 (+) — Chassis ground (−)
(F49) No. 23 (+) — Chassis ground (−)
(F49) No. 31 (+) — Chassis ground (−)
(F49) No. 3 (+) — Chassis ground (−)
(F49) No. 51 (+) — Chassis ground (−)
(F49) No. 50 (+) — Chassis ground (−)
(F49) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

NO : Repair harness between hydraulic unit and ABSCM and check all fuses.

4) Turn ignition switch to OFF.
5) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 30 (+) — Chassis ground (−)
(F49) No. 24 (+) — Chassis ground (−)
(F49) No. 23 (+) — Chassis ground (−)
(F49) No. 31 (+) — Chassis ground (−)
(F49) No. 3 (+) — Chassis ground (−)
(F49) No. 51 (+) — Chassis ground (−)
(F49) No. 50 (+) — Chassis ground (−)
(F49) No. 4 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10AC10.**

NO : Repair harness between hydraulic unit and ABSCM and check all fuses.

10AC10	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

CHECK ***: Is there poor contact in connector between ABSCM and hydraulic unit?***

YES : Repair connector.

NO : Go to step **10AC11.**

10AC11	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

AD: 52 M. RELAY OPEN
— OPEN CIRCUIT OF MOTOR RELAY —

DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

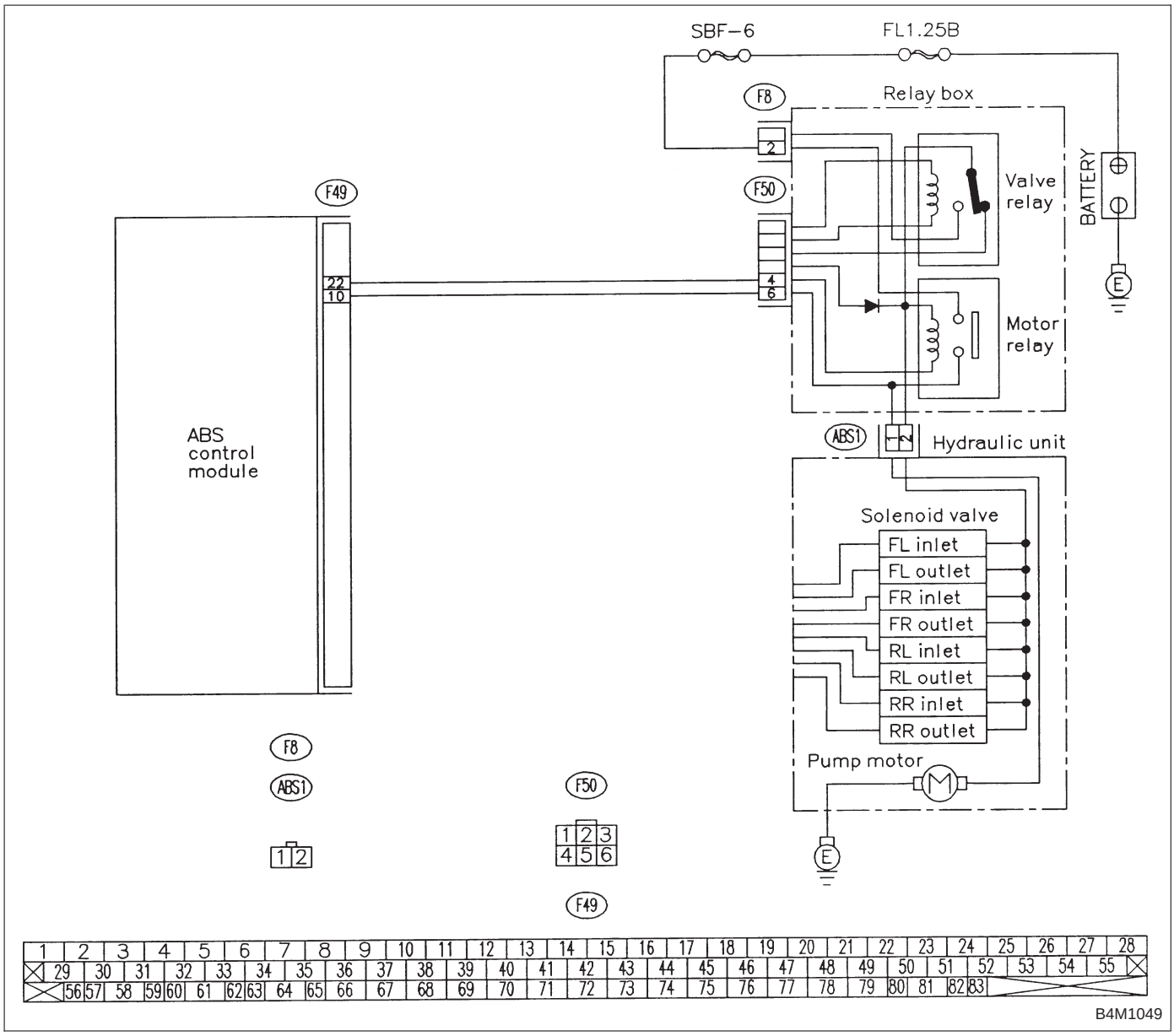
10AD1.	**Check resistance of motor relay.**
10AD2.	**Check contact point of motor relay.**
10AD3.	**Check short of motor relay.**
10AD4.	**Check input voltage of relay box.**
10AD5.	**Check input voltage of motor relay.**
10AD6.	**Check broken wire in contact point circuit of relay box.**
10AD7.	**Check ground short in contact point circuit of relay box.**
10AD8.	**Check broken wire in monitor system circuit of relay box.**
10AD9.	**Check broken wire in control circuit of relay box.**
10AD10.	**Check ground short in control circuit of relay box.**
10AD11.	**Check battery short in control circuit of relay box.**
10AD12.	**Check broken wire in monitor system harness.**
10AD13.	**Check broken wire in relay control system harness.**
10AD14.	**Check ground short between relay box and ABSCM.**

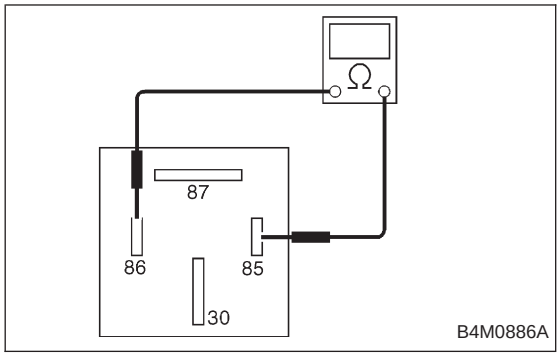
Continues to next page.

From the former page.

10AD15.	**Check battery short between relay box and ABSCM.**
10AD16.	**Check ground short at ABSCM monitor terminal.**
10AD17.	**Check ABSCM motor drive terminal.**
10AD18.	**Check motor operation.**
10AD19.	**Check poor contact in connector between hydraulic unit, relay box and ABSCM.**
10AD20.	**Check ABSCM.**

WIRING DIAGRAM:





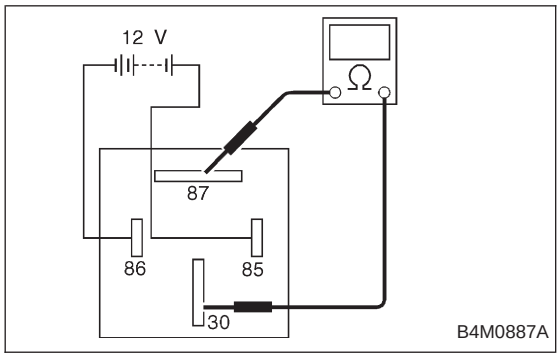
10AD1	CHECK RESISTANCE OF MOTOR RELAY.

1) Turn ignition switch to OFF.
2) Remove motor relay from relay box.
3) Measure resistance between motor relay terminals.

CHECK : ***Terminals***
No. 85 — No. 86
Is resistance 80±10 Ω?

YES : Go to step **10AD2.**

NO : Replace motor relay.



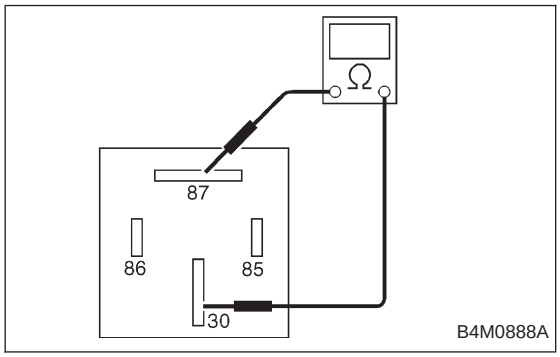
10AD2	CHECK CONTACT POINT OF MOTOR RELAY.

1) Connect battery to motor relay terminals No. 85 and No. 86.
2) Measure resistance between motor relay terminals.

CHECK : ***Terminals***
No. 30 — No. 87
Is resistance less than 0.5 Ω?

YES : Go to next step.

NO : Replace motor relay.

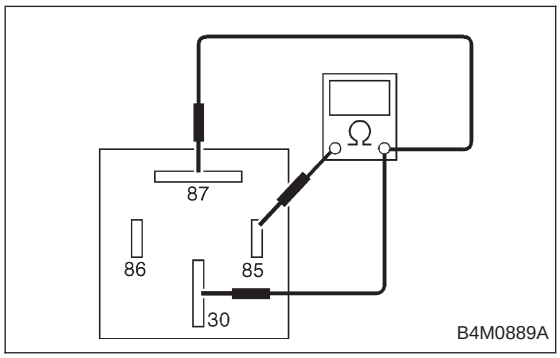


3) Disconnect battery from motor relay terminals.
4) Measure resistance between motor relay terminals.

CHECK : ***Terminals***
No. 30 — No. 87
Is resistance more than 1 MΩ?

YES : Go to step **10AD3.**

NO : Replace motor relay.



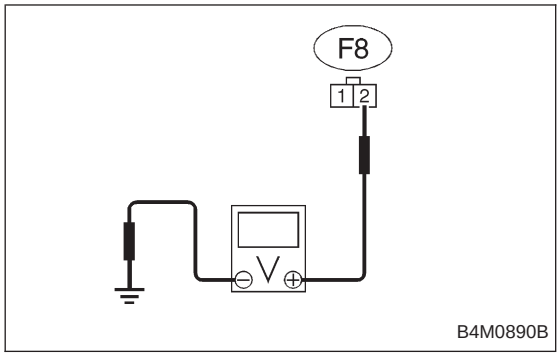
10AD3	CHECK SHORT OF MOTOR RELAY.

Measure resistance between motor relay terminals.

CHECK : ***Terminals***
No. 85 — No. 30
No. 85 — No. 87
Is resistance more than 1 MΩ?

YES : Go to step **10AD4.**

NO : Replace motor relay.



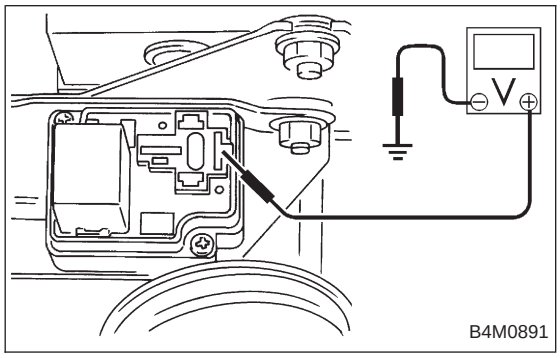
10AD4	CHECK INPUT VOLTAGE OF RELAY BOX.

1) Disconnect connector (F8) from relay box.
2) Measure voltage between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
(F8) No. 2 (+) — Chassis ground (−)
Is voltage 10 — 13 V?

YES : Go to step **10AD5.**

NO : Repair harness connector between battery and relay box. Check fuse SBF6.



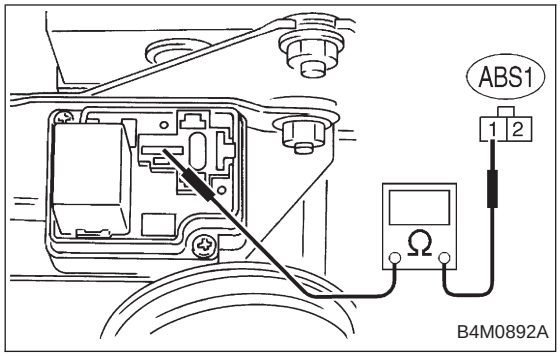
10AD5	CHECK INPUT VOLTAGE OF MOTOR RELAY.

1) Connect connector (F8) to relay box.
2) Measure voltage between relay box and chassis ground.

CHECK : ***Connector & terminal***
Relay installing point No. 87 (+) — Chassis ground (−)
Is voltage 10 — 13 V?

YES : Go to step **10AD6.**

NO : Replace relay box and fuse SBF6.



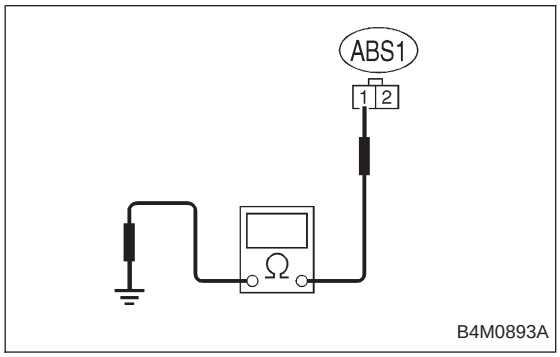
10AD6	CHECK BROKEN WIRE IN CONTACT POINT CIRCUIT OF RELAY BOX.

1) Disconnect connector (ABS1) from hydraulic unit.
2) Measure resistance between hydraulic unit and motor relay installing portion.

CHECK ***: Connector & terminal***
(ABS1) No. 1 — Motor relay installing portion No. 30
Is resistance less than 0.5 Ω?

YES : Go to step **10AD7.**

NO : Replace relay box.



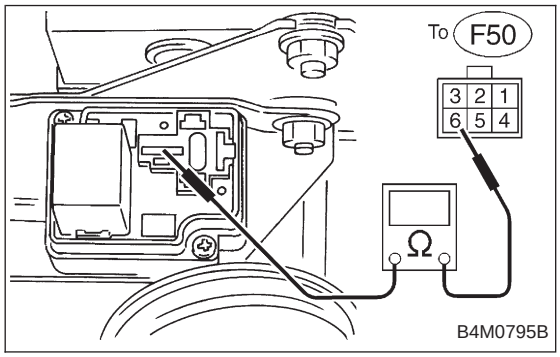
10AD7	CHECK GROUND SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.

Measure resistance between hydraulic unit and chassis ground.

CHECK ***: Connector & terminal***
(ABS1) No. 1 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10AD8.**

NO : Replace relay box. Check fuse No. 19.



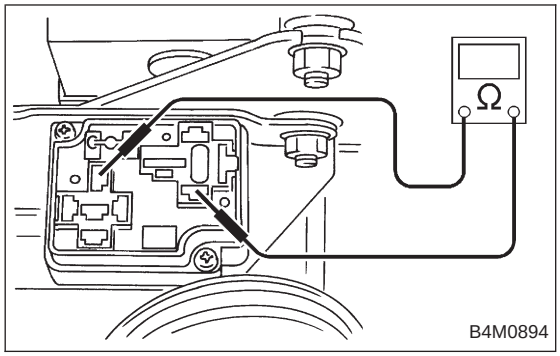
10AD8	CHECK BROKEN WIRE IN MONITOR SYSTEM CIRCUIT OF RELAY BOX.

1) Disconnect connector (F50) from relay box.
2) Measure resistance between relay box connector and motor relay installing point.

CHECK ***: Connector & terminal***
To (F50) No. 6 — Motor relay installing point No. 30
Is resistance less than 0.5 Ω?

YES : Go to step **10AD9.**

NO : Replace relay box.

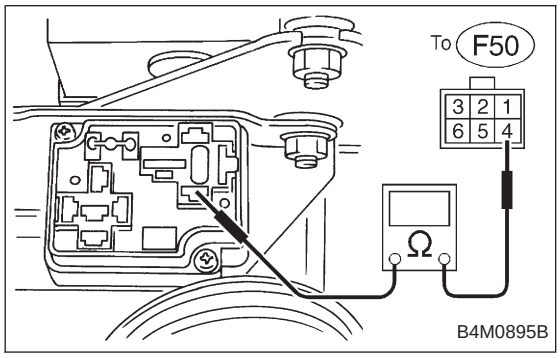


10AD9	CHECK BROKEN WIRE IN CONTROL CIRCUIT OF RELAY BOX.

1) Remove valve relay from relay box.
2) Measure resistance between motor relay installing point and valve relay installing point.

CHECK ***: Connector & terminal***
Motor relay installing point No. 86 — Valve relay installing point No. 30
Is resistance less than 0.5 Ω?

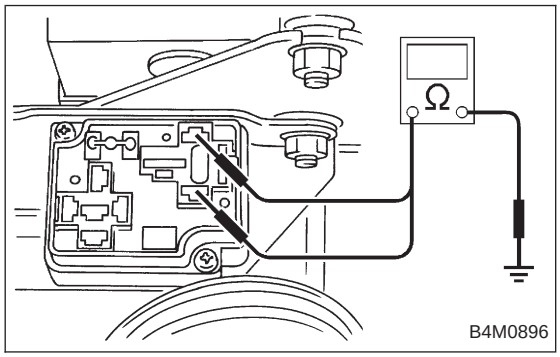
YES : Go to next step.
NO : Replace relay box.



3) Measure resistance between motor relay installing point and relay box connector.

CHECK ***: Connector & terminal***
Motor relay installing point No. 86 — To (F50) No. 4
Is resistance less than 0.5 Ω?

YES : Go to step **10AD10.**
NO : Replace relay box.

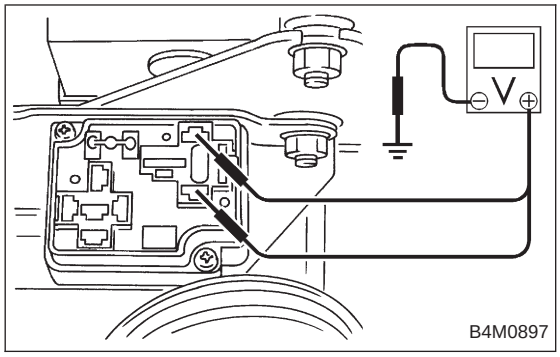


10AD10	CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.

Measure resistance between relay box and chassis ground.

CHECK ***: Connector & terminal***
Motor relay installing point No. 86 — Chassis ground
Motor relay installing point No. 85 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10AD11.**
NO : Replace relay box. Check fuse No. 19.



10AD11	CHECK BATTERY SHORT IN CONTROL CIRCUIT OF RELAY BOX.

1) Disconnect connector from ABSCM.
2) Turn ignition switch to ON.
3) Measure voltage between motor relay installing point and chassis ground.

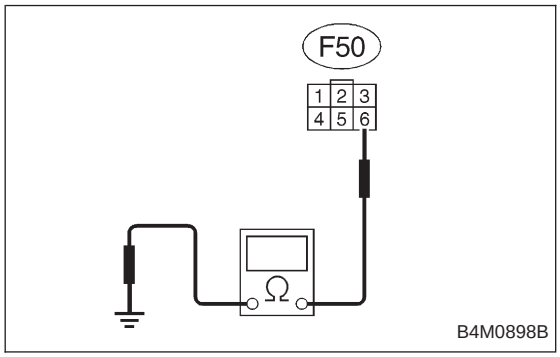
CHECK : ***Connector & terminal***
Motor relay installing point No. 85 (+) — Chassis ground (−)
Motor relay installing point No. 86 (+) — Chassis ground (−).
Is voltage 0 V?

YES : Go to next step.
NO : Replace relay box and check all fuses.

4) Turn ignition switch to OFF.
5) Measure voltage between motor relay installing point and chassis ground.

CHECK : ***Connector & terminal***
Motor relay installing point No. 85 (+) — Chassis ground
Motor relay installing point No. 86 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10AD12.**
NO : Replace relay box and check all fuses.

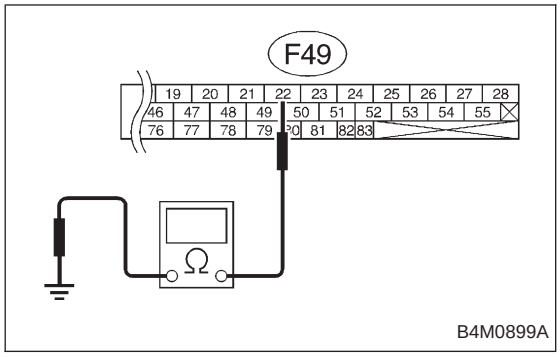


10AD12	CHECK BROKEN WIRE IN MONITOR SYSTEM HARNESS.

1) Connect between terminals No. 10 and No. 1 of ABSCM connector (F49) with a lead wire.
2) Measure resistance between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
(F50) No. 6 — Chassis ground
Is resistance less than 0.5 Ω?

YES : Go to step **10AD13.**
NO : Repair harness connector between ABSCM and relay box.



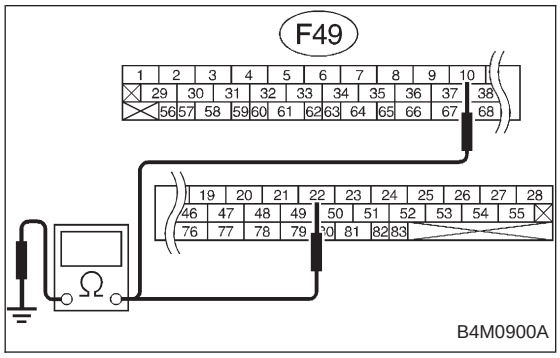
10AD13	CHECK BROKEN WIRE IN RELAY CONTROL SYSTEM HARNESS.

1) Connect valve relay and motor relay to relay box.
2) Connect connector (F50) to relay box.
3) Connect connector to hydraulic unit.
4) Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 22 — Chassis ground
Is resistance 80±10 Ω?

YES : Go to step **10AD14.**

NO : Repair harness connector between ABSCM and relay box.



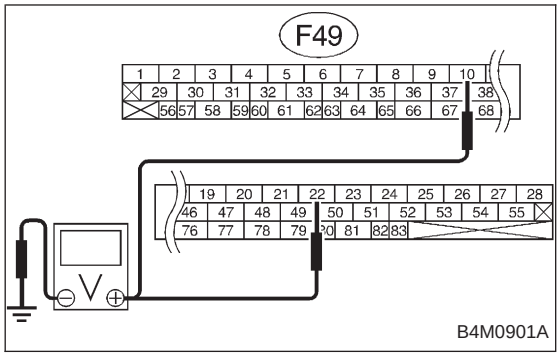
10AD14	CHECK GROUND SHORT BETWEEN RELAY BOX AND ABSCM.

1) Disconnect connector (F50) from relay box.
2) Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 22 — Chassis ground
(F49) No. 10 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10AD15.**

NO : Repair harness between ABSCM and relay box. Check fuse No. 19 and SBF6.



10AD15	CHECK BATTERY SHORT BETWEEN RELAY BOX AND ABSCM.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM and chassis ground.

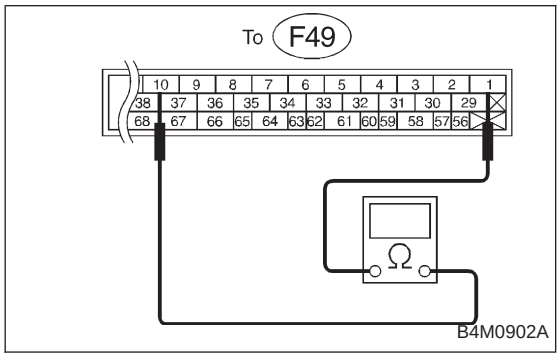
CHECK : ***Connector & terminal***
(F49) No. 22 (+) — Chassis ground (−)
(F49) No. 10 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.
NO : Repair harness between relay box and ABSCM. Check fuse SBF6.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 22 (+) — Chassis ground (−)
(F49) No. 10 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10AD16.**
NO : Repair harness between relay box and ABSCM. Check fuse SBF6.

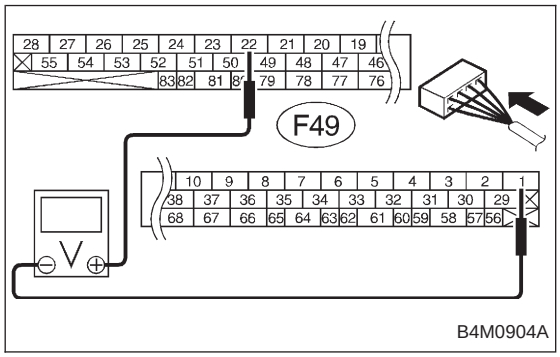


10AD16	CHECK GROUND SHORT AT ABSCM MONITOR TERMINAL.

Measure resistance between ABSCM terminals.

CHECK : ***Connector & terminal***
To (F49) No. 10 — No. 1
Is resistance more than 1 MΩ?

YES : Go to step **10AD17.**
NO : Replace ABSCM.

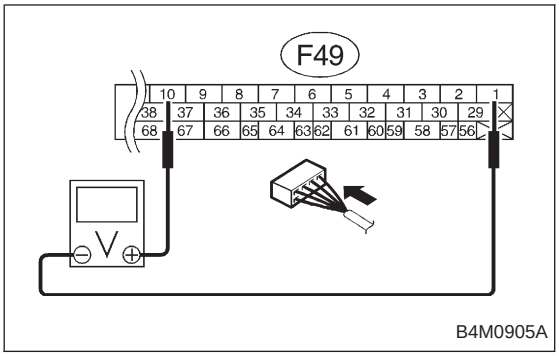


10AD17	CHECK ABSCM MOTOR DRIVE TERMINAL.

1) Disconnect connector cover from ABSCM connector. <Ref. to 4-4c [T8C3] steps 5) to 8).>
2) Connect all connectors.
3) Measure voltage between ABSCM connector terminals.
4) Operate the check sequence. <Ref. to 4-4 [W22D1].>

CHECK : ***Connector & terminals***
(F49) No. 22 (+) — No. 1 (−)
Does the voltage drop from 10 — 13 V to less than 1.5 V, and rise to 10 — 13 V again when carrying out the check sequence?

YES : Go to step **10AD18.**
NO : Replace ABSCM.



10AD18	CHECK MOTOR OPERATION.

1) Measure voltage between ABSCM connector terminal.
2) Operate the check sequence. <Ref. to 4-4 [W22D1].>

CHECK : ***Connector & terminals (F49) No. 10 (+) — No. 1 (−) Does the voltage raise from less than 1.5 V to 10 — 13 V, and return to less than 1.5 V again when carrying out the check sequence? Can motor revolution noise (buzz) be heard when carrying out the check sequence?***

YES : Go to step **10AD19.**

NO : Replace hydraulic unit.

10AD19	CHECK POOR CONTACT IN CONNECTOR BETWEEN HYDRAULIC UNIT, RELAY BOX AND ABSCM.

CHECK : ***Is there poor contact in connector between hydraulic unit, relay box and ABSCM?***

YES : Repair connector.

NO : Go to step **10AD20.**

10AD20	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

AE: 52 M. RELAY ON
— MOTOR RELAY ON FAILURE —

DIAGNOSIS:

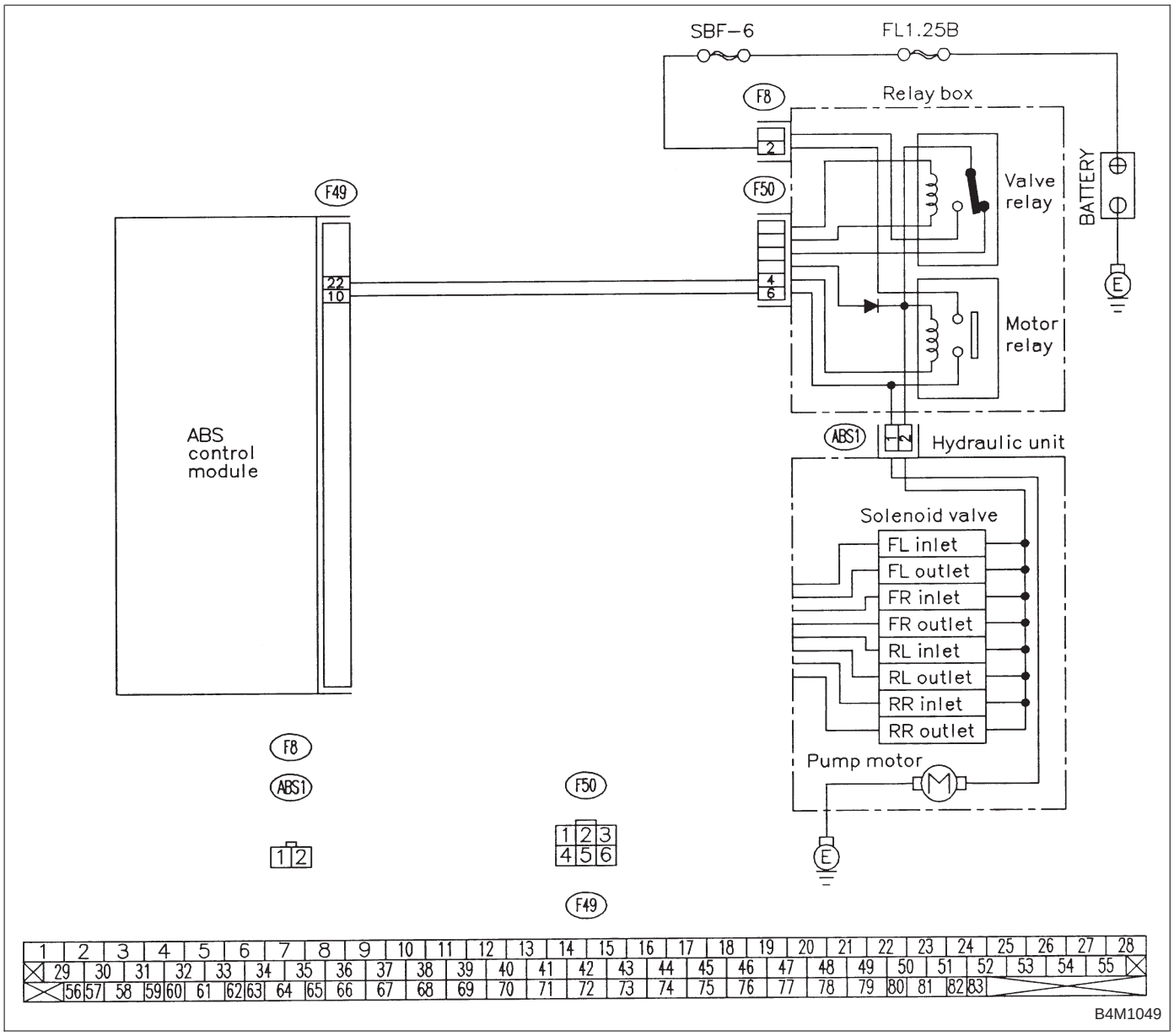
- Faulty motor
- Faulty motor relay
- Faulty harness connector

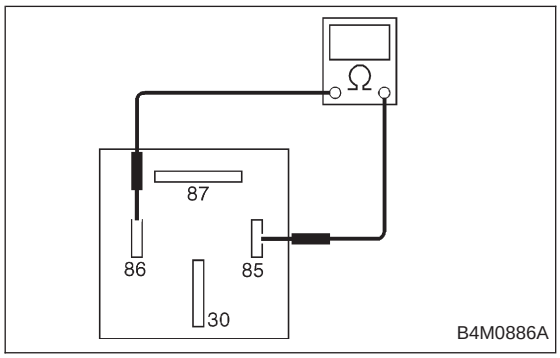
TROUBLE SYMPTOM:

- ABS does not operate.

10AE1.	**Check resistance of motor relay.**
10AE2.	**Check contact point of motor relay.**
10AE3.	**Check short of motor relay.**
10AE4.	**Check battery short in contact point circuit of relay box.**
10AE5.	**Check ground short in control circuit of relay box.**
10AE6.	**Check ground short between relay box and ABSCM.**
10AE7.	**Check battery short between relay box and ABSCM.**
10AE8.	**Check battery short at ABSCM monitor terminal.**
10AE9.	**Check motor ground.**
10AE10.	**Check ABSCM motor drive terminal.**
10AE11.	**Check motor operation.**
10AE12.	**Check poor contact in connector between hydraulic unit, relay box and ABSCM.**
10AE13.	**Check ABSCM.**

WIRING DIAGRAM:





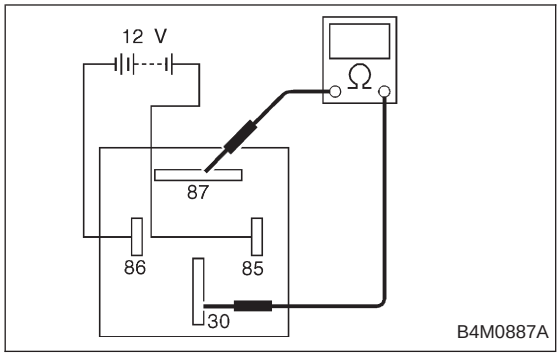
10AE1	CHECK RESISTANCE OF MOTOR RELAY.

1) Turn ignition switch to OFF.
2) Remove motor relay from relay box.
3) Measure resistance between motor relay terminals.

CHECK : ***Terminals***
No. 85 — No. 86
Is resistance 80±10 Ω?

YES : Go to step **10AE2.**

NO : Replace motor relay.

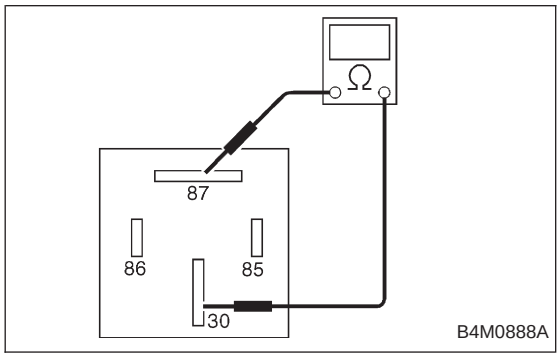


10AE2	CHECK CONTACT POINT OF MOTOR RELAY.

1) Connect battery to motor relay terminals No. 85 and No. 86.
2) Measure resistance between motor relay terminals.

CHECK ***: Terminals***
No. 30 — No. 87
Is resistance less than 0.5 Ω?

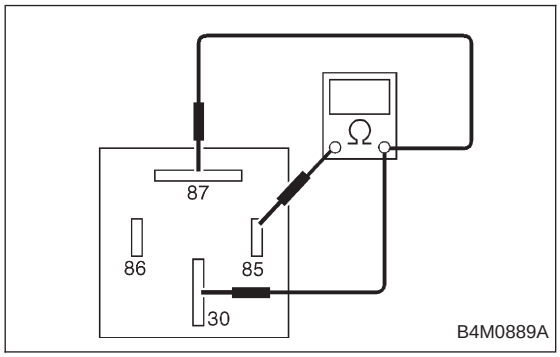
YES : Go to next step.
NO : Replace motor relay.



3) Disconnect battery from motor relay terminals.
4) Measure resistance between motor relay terminals.

CHECK ***: Terminals***
No. 30 — No. 87
Is resistance more than 1 MΩ?

YES : Go to step **10AE3.**
NO : Replace motor relay.

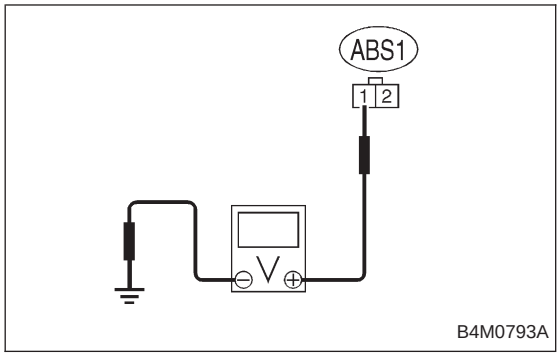


10AE3	CHECK SHORT OF MOTOR RELAY.

Measure resistance between motor relay terminals.

CHECK ***: Terminals***
No. 85 — No. 30
No. 85 — No. 87
Is resistance more than 1 MΩ?

YES : Go to step **10AE4.**
NO : Replace motor relay.



10AE4	CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.

1) Disconnect connector from ABSCM.
2) Disconnect connector (ABS1) from hydraulic unit.
3) Turn ignition switch to ON.
4) Measure voltage between relay box connector and chassis ground.

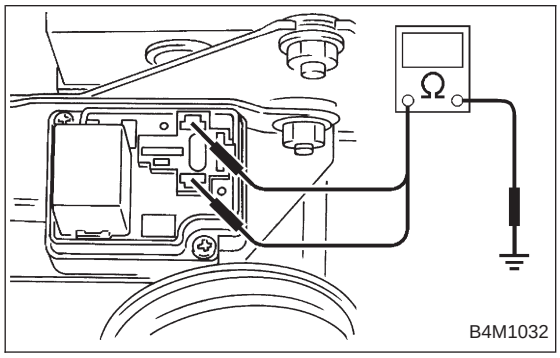
CHECK : ***Connector & terminal***
(ABS1) No. 1 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.
NO : Replace relay box.

5) Turn ignition switch to OFF.
6) Measure voltage between relay box connector and chassis ground.

CHECK : ***Connector & terminal***
(ABS1) No. 1 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10AE5.**
NO : Replace relay box.

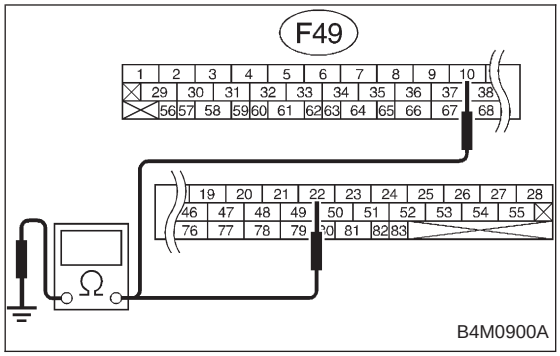


10AE5	CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.

1) Disconnect connector (F50) from relay box.
2) Measure resistance between relay box and chassis ground.

CHECK : ***Connector & terminal***
Motor relay installing point No. 85 — Chassis ground
Motor relay installing point No. 86 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10AE6.**
NO : Replace relay box. Check fuse No. 19.



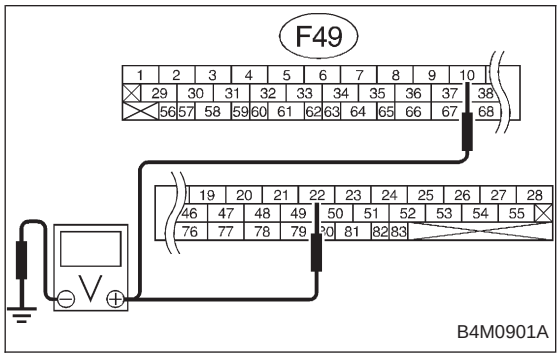
10AE6	CHECK GROUND SHORT BETWEEN RELAY BOX AND ABSCM.

1) Disconnect connector (F49) from ABSCM.
2) Measure resistance between ABSCM connector and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 22 — Chassis ground
(F49) No. 10 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10AE7.**

NO : Repair harness between ABSCM and relay box. Check fuse No. 19 and SBF6.



10AE7	CHECK BATTERY SHORT BETWEEN RELAY BOX AND ABSCM.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 22 (+) — Chassis ground (−)
(F49) No. 10 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to next step.

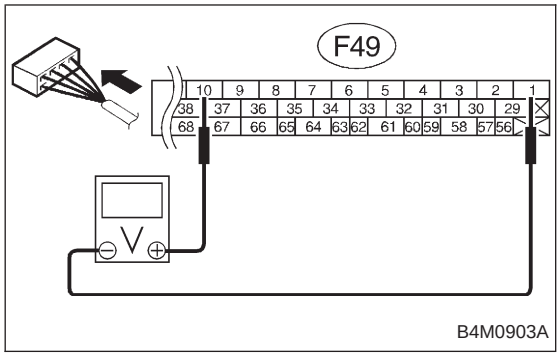
NO : Repair harness between relay box and ABSCM. Check fuse SBF6.

3) Turn ignition switch to OFF.
4) Measure voltage between ABSCM and chassis ground.

CHECK : ***Connector & terminal***
(F49) No. 22 (+) — Chassis ground (−)
(F49) No. 10 (+) — Chassis ground (−)
Is voltage 0 V?

YES : Go to step **10AE8.**

NO : Repair harness between relay box and ABSCM. Check fuse SBF6.



10AE8	CHECK BATTERY SHORT AT ABSCM MONITOR TERMINAL.

1) Disconnect connector cover from ABSCM connector. <Ref. to 4-4c [T8C1] steps 5) to 8).>
2) Connect all connectors.
3) Turn ignition switch to ON.
4) Measure voltage between ABSCM connector terminals.

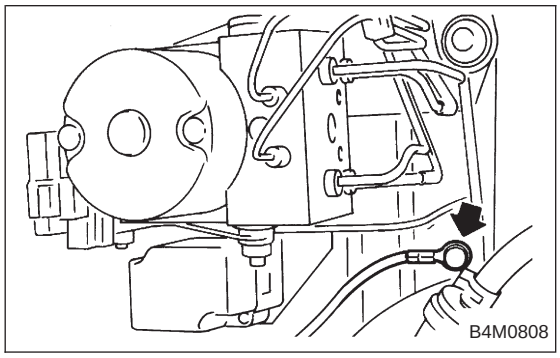
CHECK ***: Connector & terminal***
(F49) No. 10 (+) — No. 1 (−)
Is voltage less than 2 V?

YES : Go to next step.
NO : Replace ABSCM.

5) Turn ignition switch to OFF.
6) Measure voltage between ABSCM connector terminals.

CHECK ***: Connector & terminals***
(F49) No. 10 (+) — No. 1 (−)
Is voltage less than 2 V?

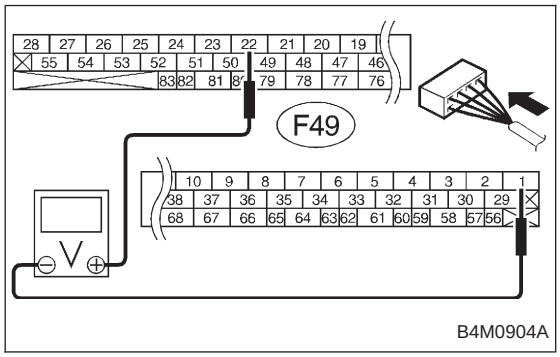
YES : Go to step **10AE9.**
NO : Replace ABSCM.



10AE9	CHECK MOTOR GROUND.

CHECK ***: Tightening torque:***
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)
Is the motor ground terminal tightly clamped?

YES : Go to step **10AE10.**
NO : Tighten the clamp of motor ground terminal.

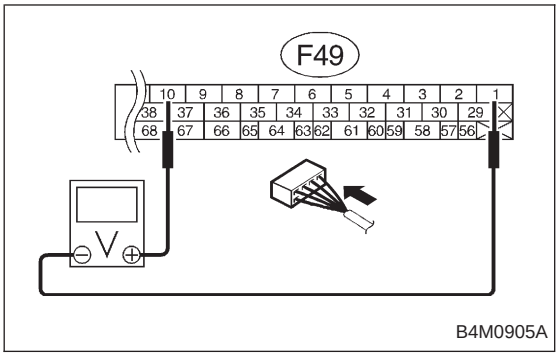


10AE10	CHECK ABSCM MOTOR DRIVE TERMINAL.

1) Measure voltage between ABSCM connector terminals.
2) Operate the check sequence. <Ref. to 4-4 [W22D1].>

CHECK ***: Connector & terminals***
(F49) No. 22 (+) — No. 1 (−)
Does the voltage drop from 10 — 13 V to less than 1.5 V, and rise to 10 — 13 V again when carrying out the check sequence?

YES : Go to step **10AE11.**
NO : Replace ABSCM.



10AE11	CHECK MOTOR OPERATION.

1) Measure voltage between ABSCM connector terminal.
2) Operate the check sequence. <Ref. to 4-4 [W22D1].>

CHECK ***: Connector & terminals (F49) No. 10 (+) — No. 1 (−) Does the voltage raise from less than 1.5 V to 10 — 13 V, and return to less than 1.5 V again when carrying out the check sequence? Can motor revolution noise (buzz) be heard when carrying out the check sequence?***

YES : Go to step **10AE12.**

NO : Replace hydraulic unit.

10AE12	CHECK POOR CONTACT IN CONNECTOR BETWEEN HYDRAULIC UNIT, RELAY BOX AND ABSCM.

CHECK ***: Is there poor contact in connector between hydraulic unit, relay box and ABSCM?***

YES : Repair connector.

NO : Go to step **10AE13.**

10AE13	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

AF: 52 MOTOR — ABNORMAL MOTOR —

DIAGNOSIS:

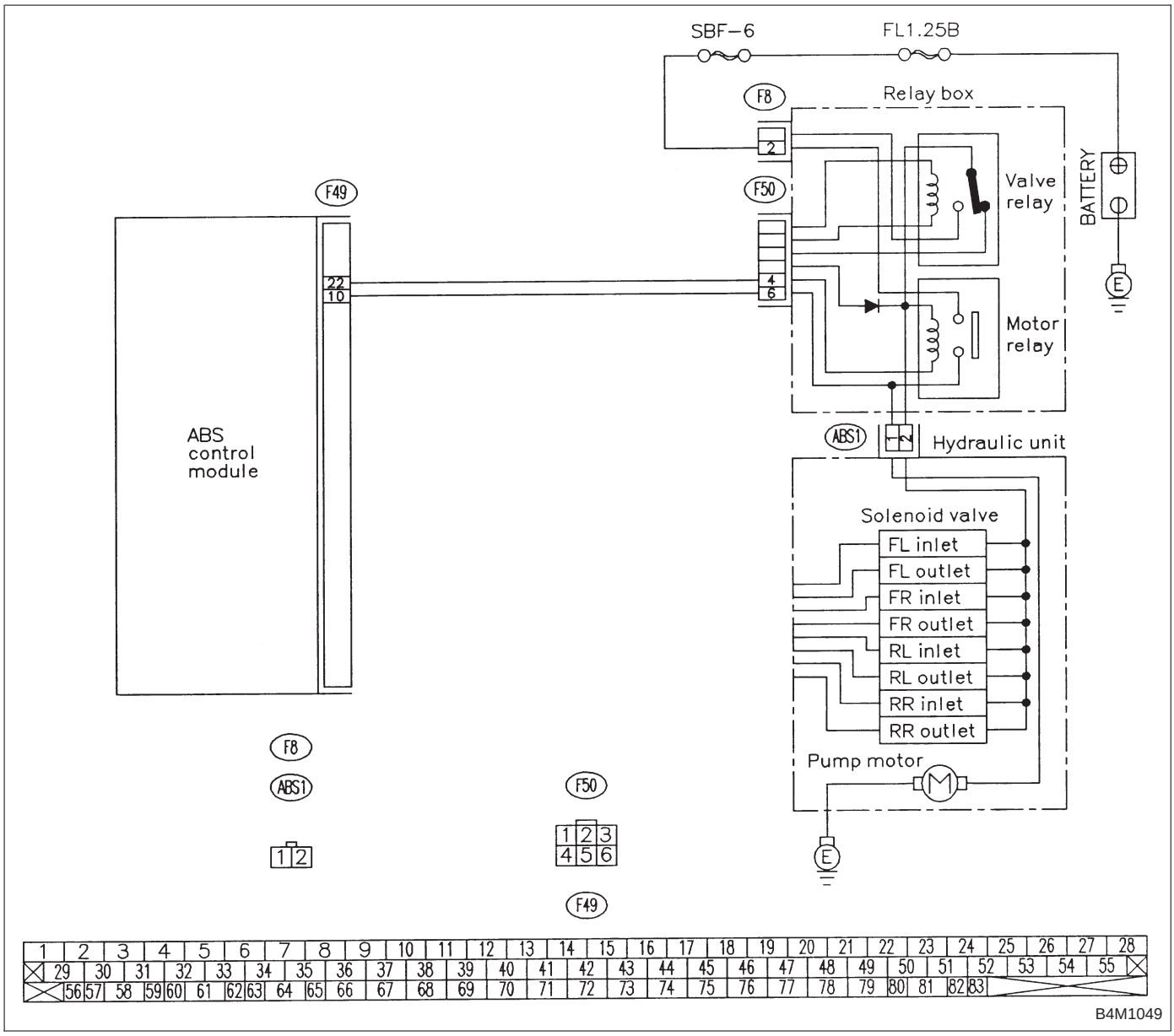
- Faulty motor
- Faulty motor relay
- Faulty harness connector

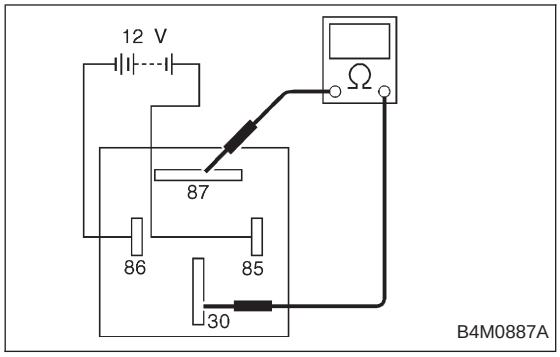
TROUBLE SYMPTOM:

- ABS does not operate.

10AF1.	**Check contact point of motor relay.**
10AF2.	**Check input voltage of relay box.**
10AF3.	**Check motor ground.**
10AF4.	**Check motor operation.**
10AF5.	**Check poor contact in connector between hydraulic unit, relay box and ABSCM.**
10AF6.	**Check ABSCM.**

WIRING DIAGRAM:



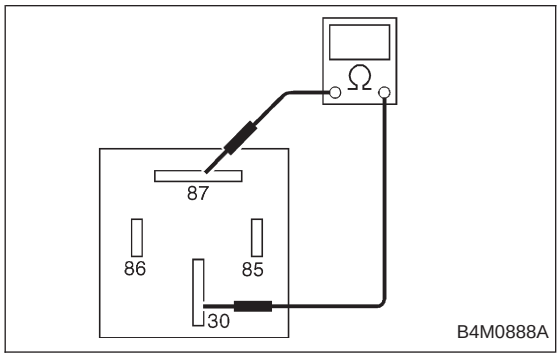


10AF1	CHECK CONTACT POINT OF MOTOR RELAY.

1) Turn ignition switch to OFF.
2) Remove motor relay from relay box.
3) Connect battery to motor relay terminals No. 85 and No. 86.
4) Measure resistance between motor relay terminals.

CHECK ***: Terminals***
No. 30 — No. 87
Is resistance less than 0.5 Ω?

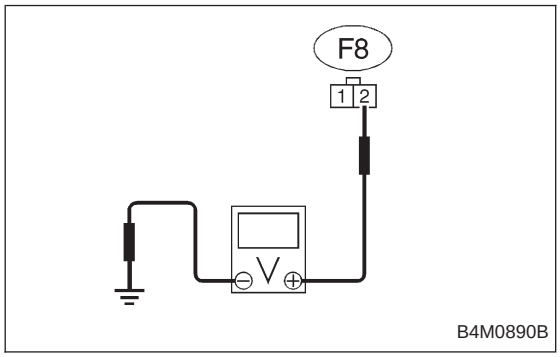
YES : Go to next step.
NO : Replace motor relay.



5) Disconnect battery from motor relay terminals.
6) Measure resistance between motor relay terminals.

CHECK ***: Terminals***
No. 30 — No. 87
Is resistance more than 1 MΩ?

YES : Go to step **10AF2.**
NO : Replace motor relay.

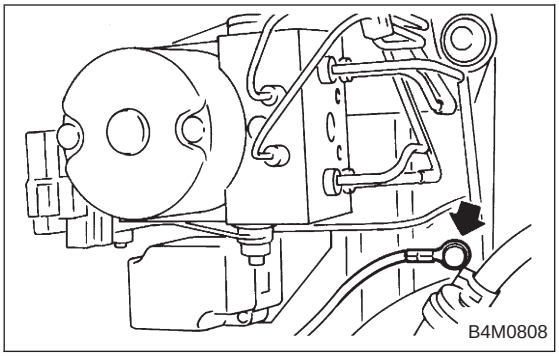


10AF2	CHECK INPUT VOLTAGE OF RELAY BOX.

1) Disconnect connector (F8) from relay box.
2) Measure voltage between relay box connector and chassis ground.

CHECK ***: Connector & terminal***
(F8) No. 2 (+) — Chassis ground (−)
Is voltage 10 — 13 V?

YES : Go to step **10AF3.**
NO : Repair harness connector between battery and relay box. Check fuse SBF6.

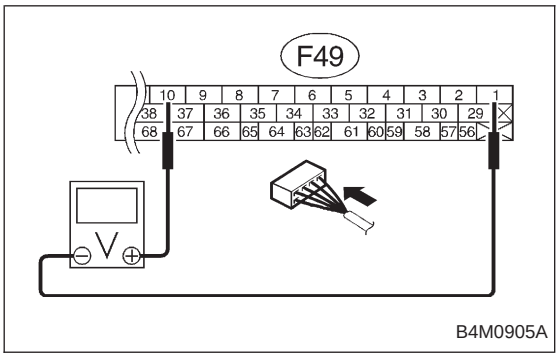

B4M0808

10AF3	CHECK MOTOR GROUND.

CHECK : ***Tightening torque:***
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)
Is the motor ground terminal tightly clamped?

YES : Go to step **10AF4.**

NO : Tighten the clamp of motor ground terminal.



B4M0905A

10AF4	CHECK MOTOR OPERATION.

1) Disconnect connector (F49) from ABSCM.
2) Disconnect connector cover from ABSCM connector (F49). <Ref. to 4-4c [T8C1] steps 5) to 8).>
3) Connect connector (F49) to ABSCM.
4) Connect motor relay to relay box.
5) Connect all connectors.
6) Measure voltage between ABSCM connector terminal.
7) Operate the check sequence. <Ref. to 4-4 [W22D1].>

CHECK : ***Connector & terminals***
(F49) No. 10 (+) — No. 1 (−)
Does the voltage raise from less than 1.5 V to 10 — 13 V, and return to less than 1.5 V again when carrying out the check sequence?
Can motor revolution noise (buzz) be heard when carrying out the check sequence?

YES : Go to step **10AF5.**

NO : Replace hydraulic unit.

10AF5	CHECK POOR CONTACT IN CONNECTOR BETWEEN HYDRAULIC UNIT, RELAY BOX AND ABSCM.

CHECK : ***Is there poor contact in connector between hydraulic unit, relay box and ABSCM?***

YES : Repair connector.

NO : Go to step **10AF6.**

10AF6	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

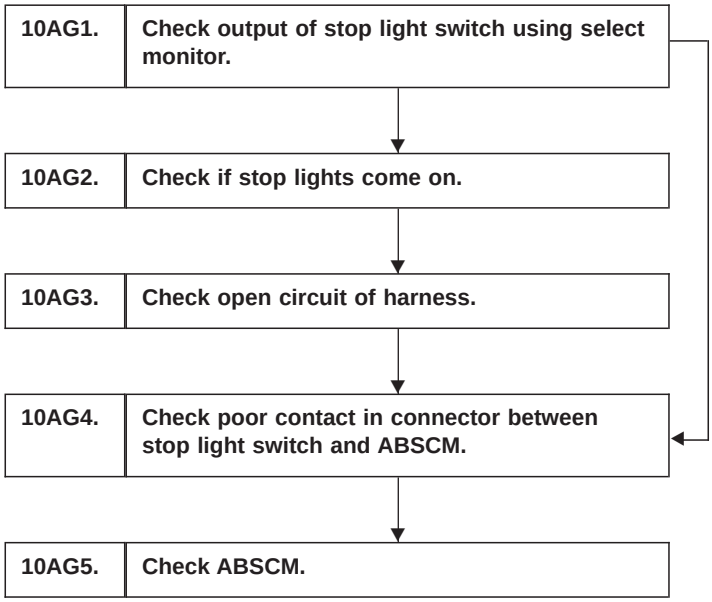
AG: 54 BLS
— ABNORMAL STOP LIGHT SWITCH —

DIAGNOSIS:

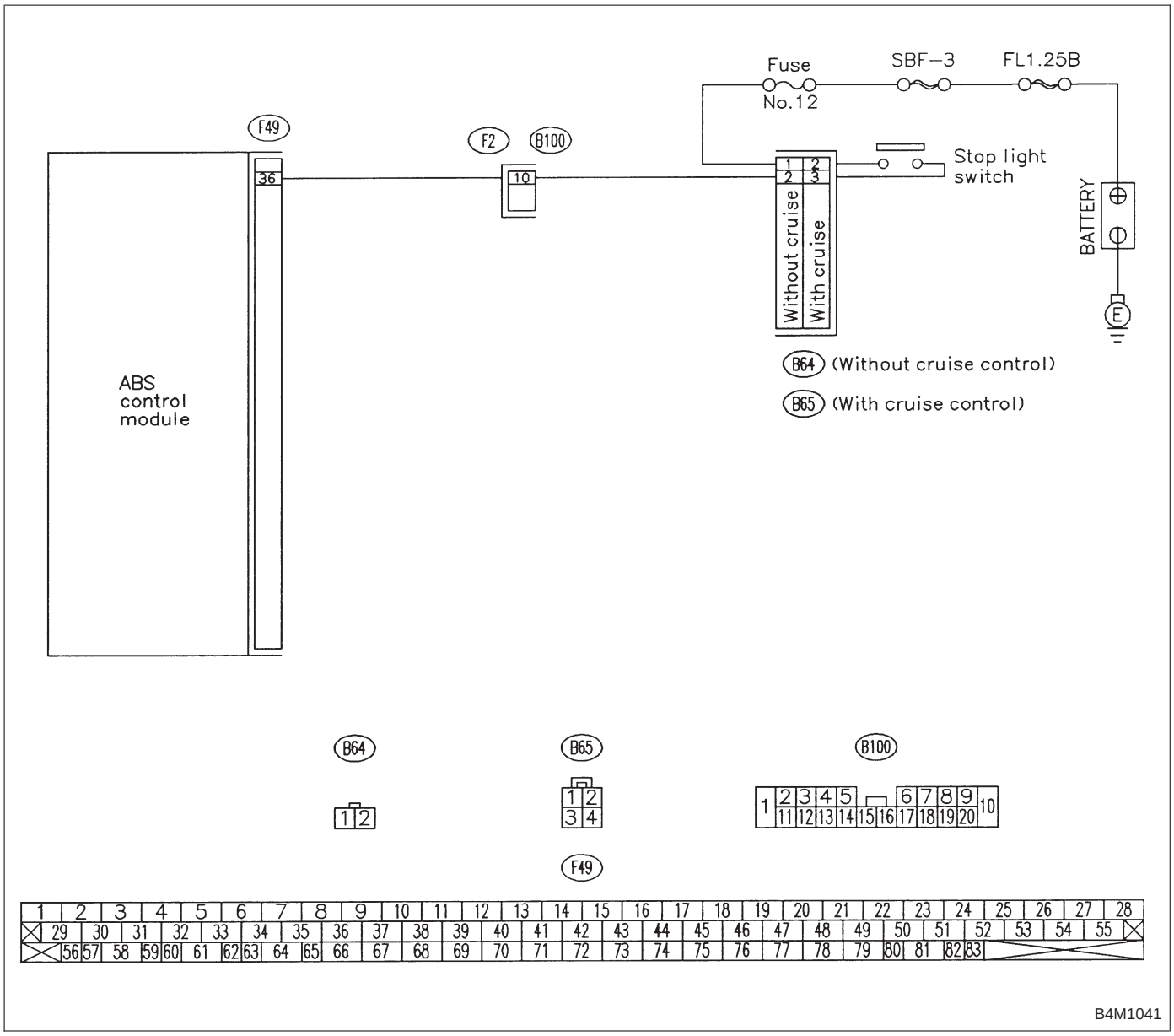
- Faulty stop light switch

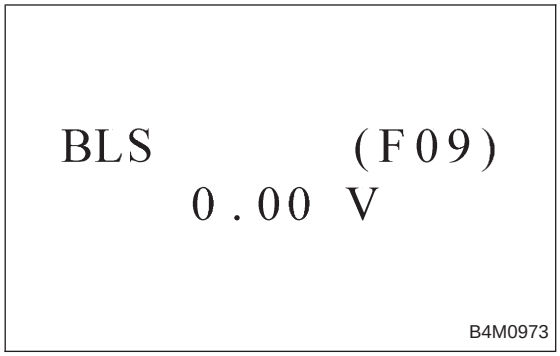
TROUBLE SYMPTOM:

- ABS does not operate.



WIRING DIAGRAM:





10AG1	CHECK OUTPUT OF STOP LIGHT SWITCH USING SELECT MONITOR.

1) Press F , 0 and 9 on the select monitor.
2) Depress the brake pedal.
3) Read the stop light switch output on the select monitor display.

CHECK ***: Is the reading indicated on monitor display less than 1.5 V?***

YES : Go to next step.

NO : Go to step **10AG1.**

4) Release the brake pedal.
5) Read the stop light switch output on the select monitor display.

CHECK ***: Is the reading indicated on monitor display greater than 4.5 V?***

YES : Go to step **10AG4.**

NO : Go to step **10AG2.**

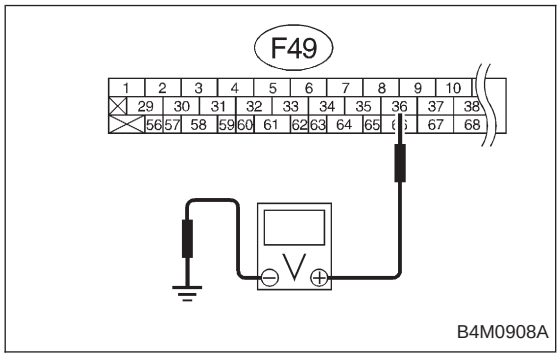
10AG2	CHECK IF STOP LIGHTS COME ON.

Depress the brake pedal.

CHECK ***: Do stop lights turn on?***

YES : Go to step **10AG3.**

NO : Repair stop lights circuit.



10AG3	CHECK OPEN CIRCUIT OF HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM.
3) Depress brake pedal.
4) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 36 — Chassis ground
Is voltage 10 — 13 V?

YES : Go to step **10AG4.**

NO : Repair harness between stop light switch and ABSCM.

10AG4	**CHECK POOR CONTACT IN CONNECTOR BETWEEN STOP LIGHT SWITCH AND ABSCM.**

CHECK ***: Is there poor contact in connector between stop light switch and ABSCM?***

YES : Repair connector.

NO : Go to step **10AG5.**

10AG5	**CHECK ABSCM.**

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

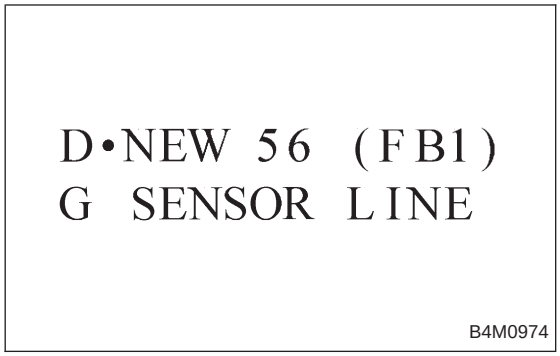
YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



AH: 56 G SENSOR LINE — OPEN OR SHORT CIRCUIT OF G SENSOR —

DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

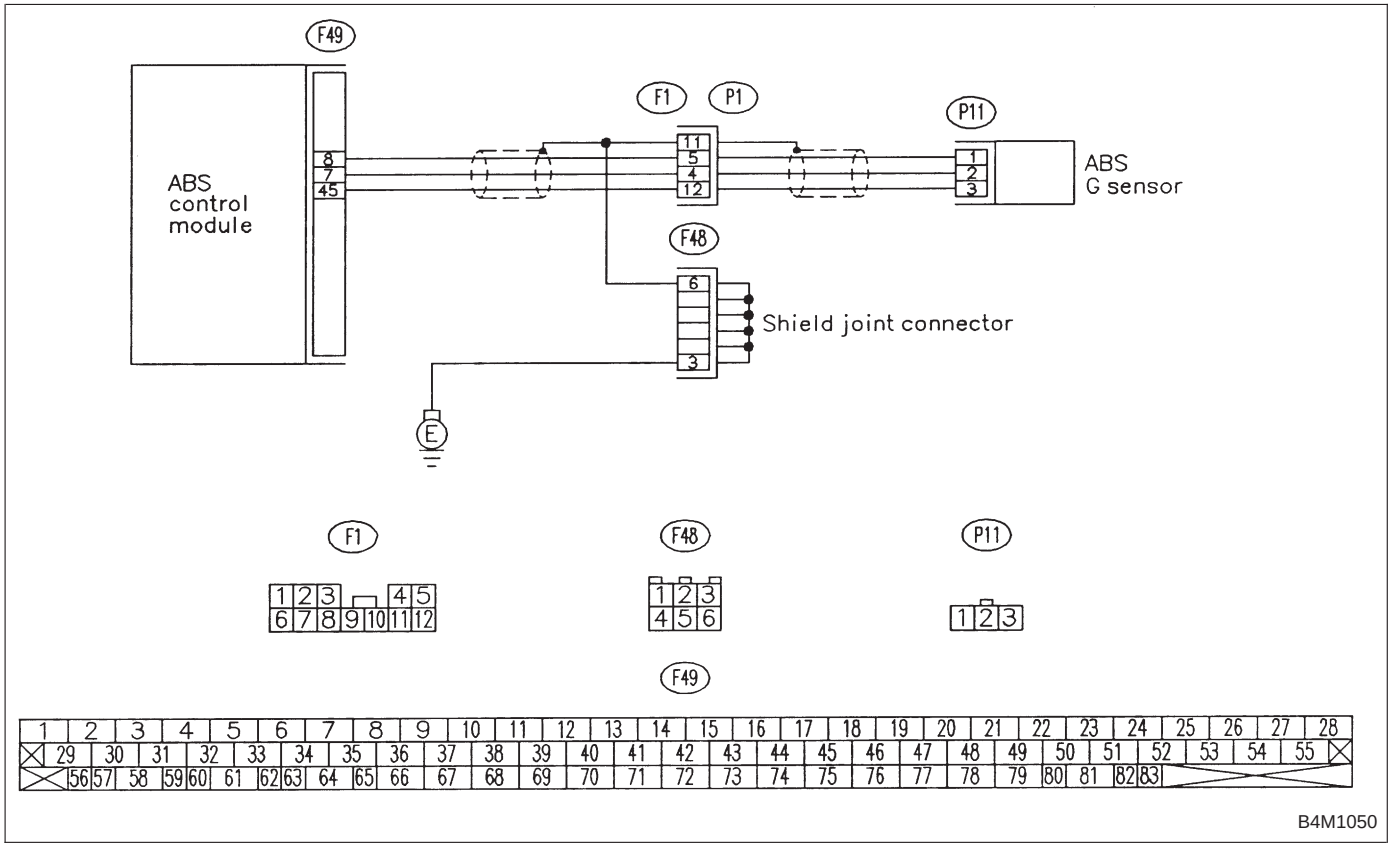
10AH1.	Check specifications of ABSCM using select monitor.
10AH2.	Check output of G sensor using select monitor.
10AH3.	Check poor contact in connector between ABSCM and G sensor.
10AH4.	Check ABSCM.
10AH5.	Check freeze frame data.
10AH6.	Check broken wire in G sensor output harness and ground harness.
10AH7.	Check poor contact in connector between ABSCM and G sensor.
10AH8.	Check ABSCM.
10AH9.	Check input voltage of G sensor.
10AH10.	Check broken wire in G sensor output harness and ground harness.

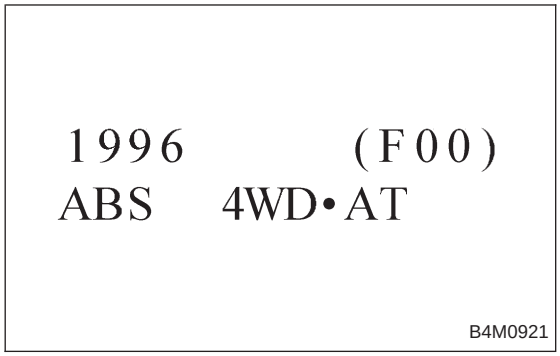
Continues to next page.

From the former page.

10AH11.	**Check ground short in G sensor output harness.**
10AH12.	**Check G sensor.**
10AH13.	**Check poor contact in connector between ABSCM and G sensor.**
10AH14.	**Check ABSCM.**

WIRING DIAGRAM:





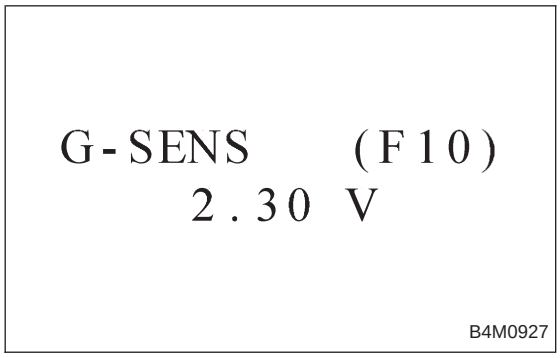
10AH1	CHECK SPECIFICATIONS OF ABSCM USING SELECT MONITOR.

1) Press F , 0 and 0 on the select monitor.
2) Read the select monitor display.

CHECK ***: Is an ABSCM for 4WD model installed on a FWD model?***

YES : Replace ABSCM.

NO : Go to step **10AH2.**



10AH2	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

1) Press F , 1 and 0 on the select monitor.
2) Read the select monitor display.

CHECK ***: Is the indicated reading 2.3±0.2 V when the G sensor is in horizontal position?***

YES : Go to step **10AH3.**

NO : Go to step **10AH5.**

10AH3	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.

CHECK ***: Is there poor contact in connector between ABSCM and G sensor?***

YES : Repair connector.

NO : Go to step **10AH4.**

10AH4	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

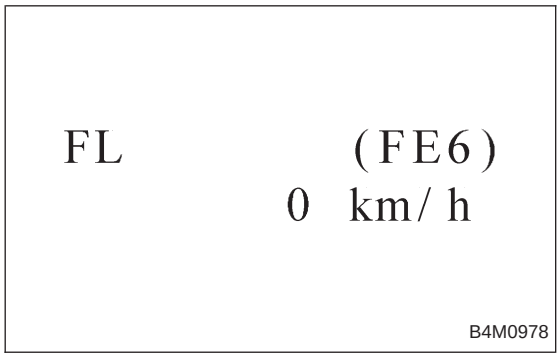
10AH5	CHECK FREEZE FRAME DATA.

1) Press F , E and 5 on the select monitor.

CHECK : ***Is the reading indicated on monitor display 0 km?***

YES : Go to next step.

NO : Go to step **10AH9.**



2) Press the scroll key so that FE6 appears on the monitor display.

CHECK : ***Is the reading indicated on monitor display 0 km?***

YES : Go to next step.

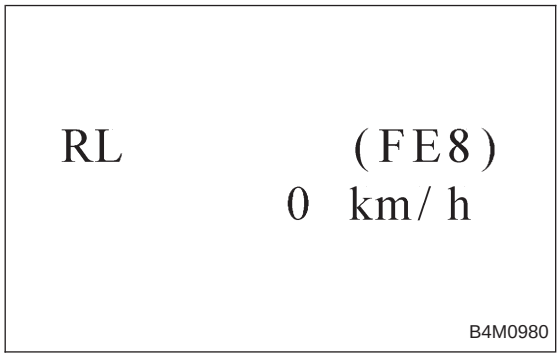
NO : Go to step **10AH9.**

3) Press the scroll key so that FE7 appears on the monitor display.

CHECK : ***Is the reading indicated on monitor display 0 km?***

YES : Go to next step.

NO : Go to step **10AH9.**

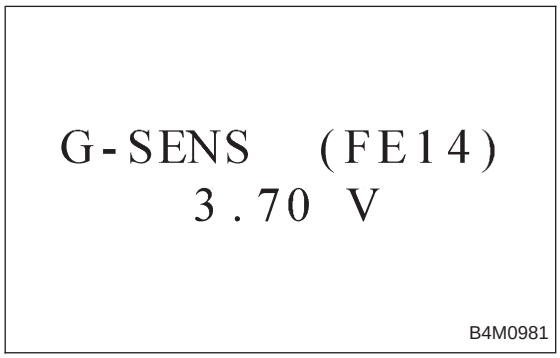


4) Press the scroll key so that FE8 appears on the monitor display.

CHECK : ***Is the reading indicated on monitor display 0 km?***

YES : Go to next step.

NO : Go to step **10AH9.**

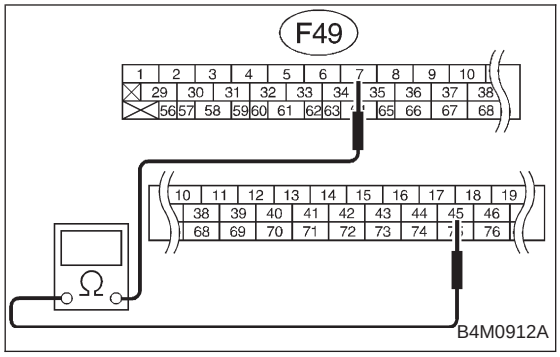


5) Press the scroll key so that FE14 appears on the monitor display.

CHECK : ***Is the reading indicated on monitor display greater than 3.65 V?***

YES : Go to step **10AH6.**

NO : Go to step **10AH9.**



10AH6	CHECK BROKEN WIRE IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM.
3) Measure resistance between ABSCM connector terminals.

CHECK ***: Connector & terminal (P49) No. 7 — No. 45 Is resistance 4.6±0.3 kΩ?***

YES : Go to step **10AH7.**

NO : Repair harness between G sensor and ABSCM.

10AH7	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.

CHECK ***: Is there poor contact in connector between ABSCM and G sensor?***

YES : Repair connector.

NO : Go to step **10AH8.**

10AH8	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

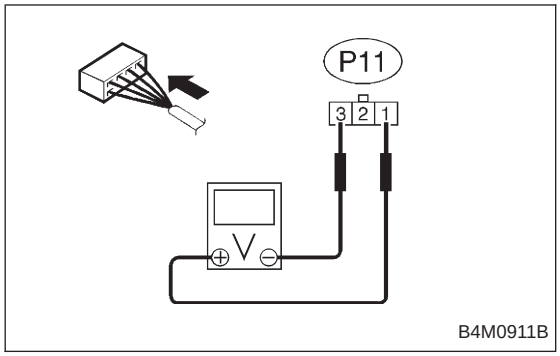
YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



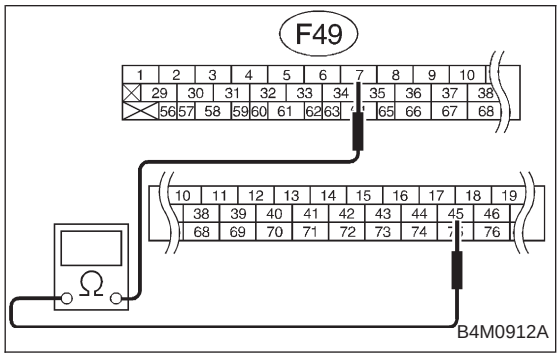
10AH9	CHECK INPUT VOLTAGE OF G SENSOR.

1) Turn ignition switch to OFF.
2) Remove console box.
3) Disconnect G sensor from body. (Do not disconnect connector.)
4) Turn ignition switch to ON.
5) Measure voltage between G sensor connector terminals.

CHECK ***: Connector & terminal***
(P11) No. 1 (+) — No. 3 (−)
Is voltage 5±0.25 V?

YES : Go to step **10AH10.**

NO : Repair harness connector between G sensor and ABSCM.



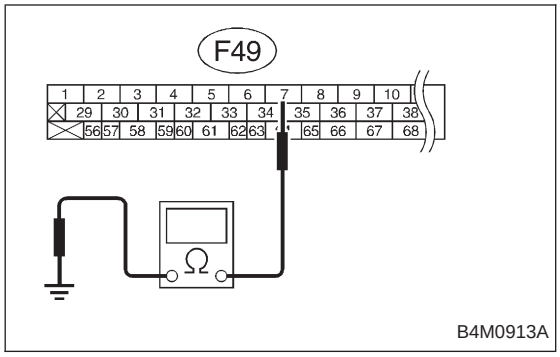
10AH10	CHECK BROKEN WIRE IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM.
3) Measure resistance between ABSCM connector terminals.

CHECK ***: Connector & terminal***
(P49) No. 7 — No. 45
Is resistance 4.6±0.3 kΩ?

YES : Go to step **10AH11.**

NO : Repair harness between G sensor and ABSCM.



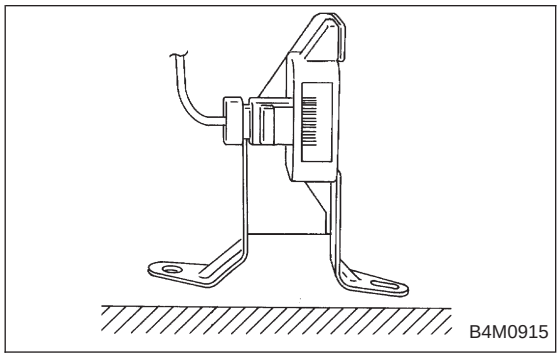
10AH11	CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS.

1) Disconnect connector from G sensor.
2) Measure resistance between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 7 — Chassis ground
Is resistance more than 1 MΩ?

YES : Go to step **10AH12.**

NO : Repair harness between G sensor and ABSCM.



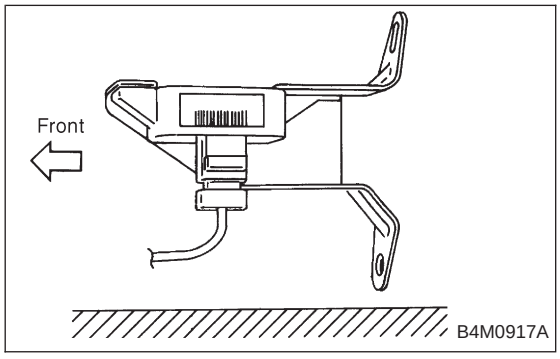
10AH12	CHECK G SENSOR.

1) Connect connector to G sensor.
2) Connect connector to ABSCM.
3) Turn ignition switch to ON.
4) Measure voltage between G sensor connector terminals.

CHECK ***: Connector & terminal***
(P11) No. 2 (+) — No. 1 (−)
Is voltage 2.3±0.2 V when G sensor is horizontal?

YES : Go to next CHECK .

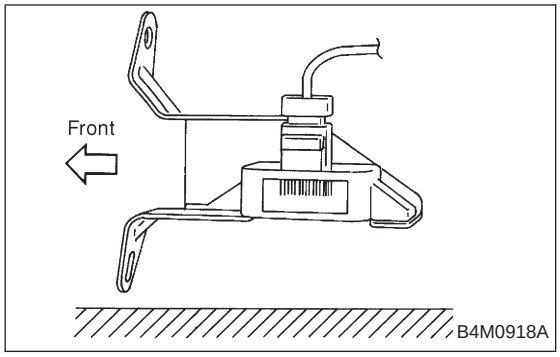
NO : Replace G sensor.



CHECK ***: Connector & terminal***
(P11) No. 2 (+) — No. 1 (−)
Is voltage 3.9±0.2 V when G sensor is inclined forwards to 90°?

YES : Go to next CHECK .

NO : Replace G sensor.



CHECK ***: Connector & terminal (P11) No. 2 (+) — No. 1 (−) Is voltage 0.7±0.2 V when G sensor is inclined backwards to 90°?***

YES : Go to step **10AH13.**

NO : Replace G sensor.

10AH13	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.

CHECK ***: Is there poor contact in connector between ABSCM and G sensor?***

YES : Repair connector.

NO : Go to step **10AH14.**

10AH14	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

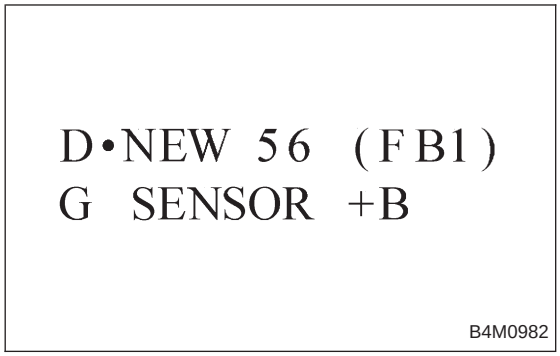
YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



AI: 56 G SENSOR +B — BATTERY SHORT OF G SENSOR —

DIAGNOSIS:

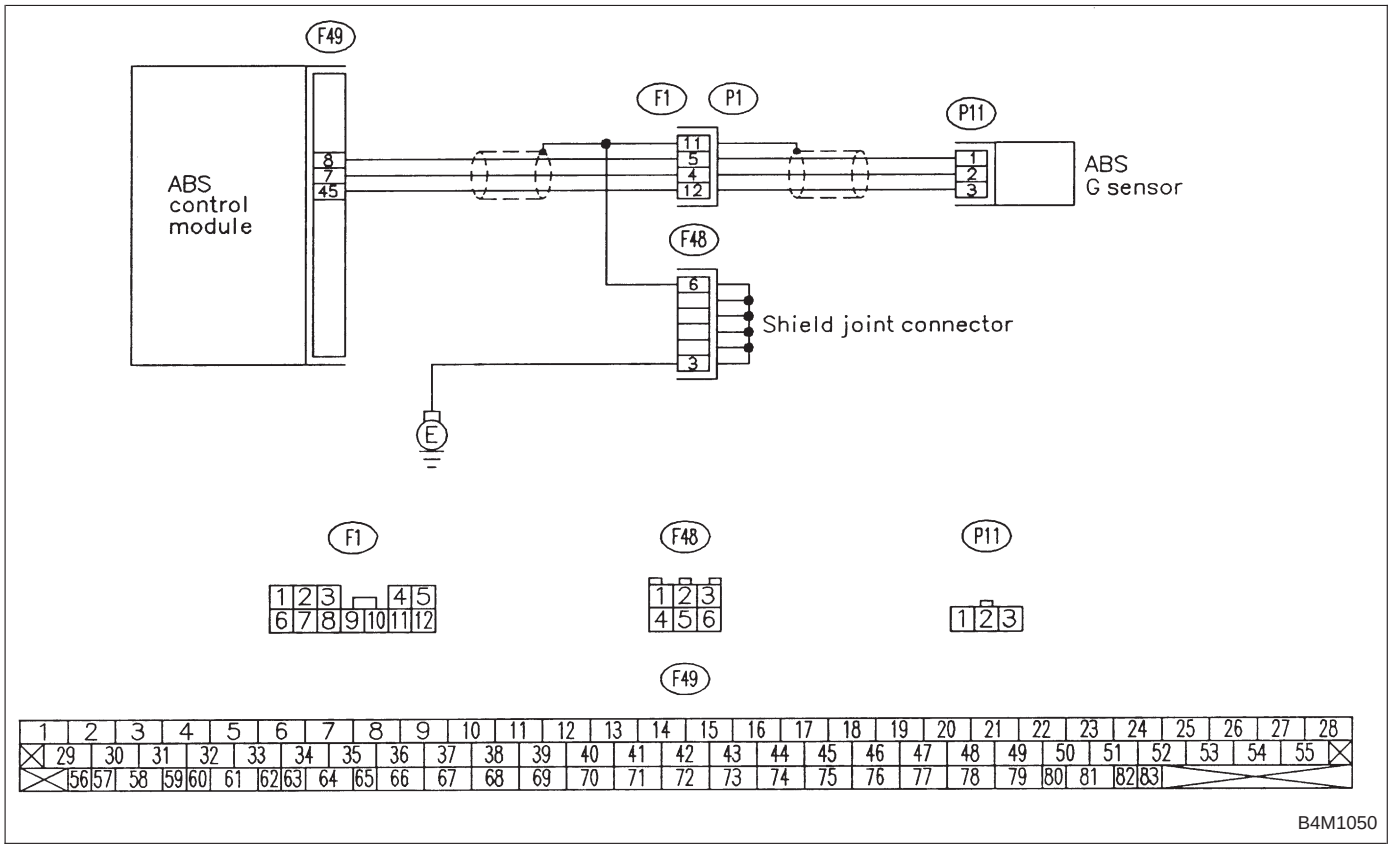
- Faulty G sensor output voltage

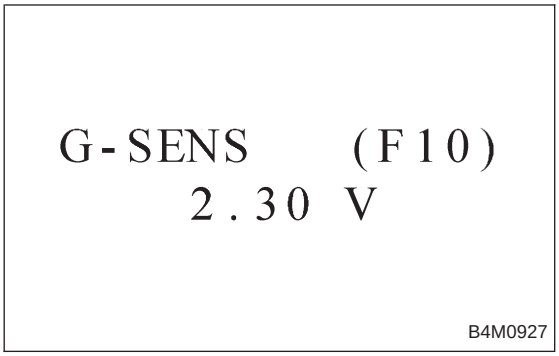
TROUBLE SYMPTOM:

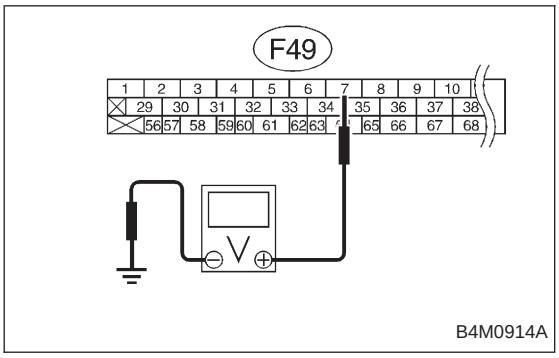
- ABS does not operate.

10AI1.	**Check output of G sensor using select monitor.**
↓	
10AI2.	**Check battery short of harness.**
↓	
10AI3.	**Check ABSCM.**

WIRING DIAGRAM:







10AI1	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

1) Press F , 1 and 0 on the select monitor.
2) Read the select monitor display.

CHECK ***: Is the indicated reading 2.3±0.2 V when the G sensor is in horizontal position?***

YES : Replace ABSCM.

NO : Go to step **10AI2.**

10AI2	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to OFF.
2) Remove console box.
3) Disconnect connector from G sensor.
4) Disconnect connector from ABSCM.
5) Turn ignition switch to ON.
6) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal (F49) No. 7 (+) — Chassis ground (−) Is voltage 0 V?***

YES : Go to next step.

NO : Repair harness between G sensor and ABSCM.

7) Turn ignition switch to OFF.
8) Measure voltage between ABSCM connector and chassis ground.

CHECK ***: Connector & terminal (F49) No. 7 (+) — Chassis ground (−) Is voltage 0 V?***

YES : Go to step **10AI3.**

NO : Repair harness between G sensor and ABSCM.

10AI3	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

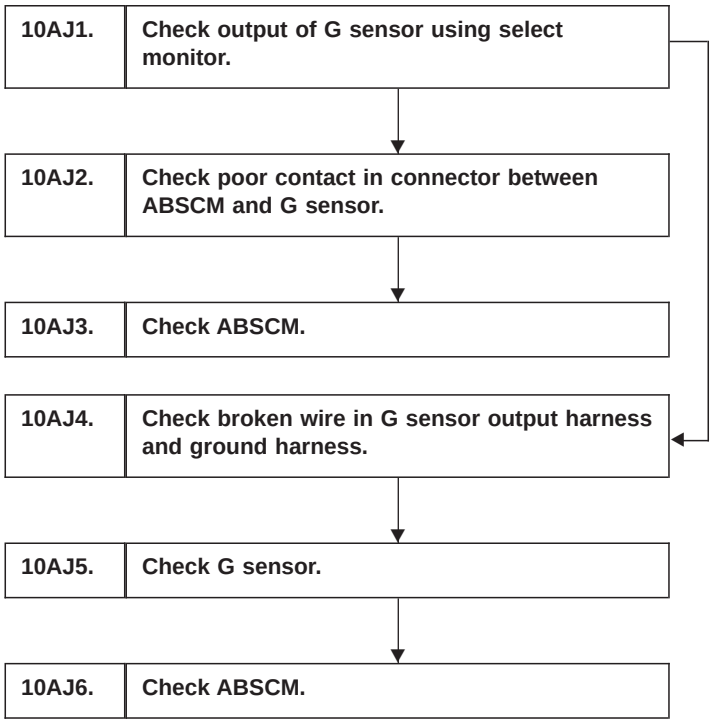
AJ: 56 G SENSOR Hμ — ABNORMAL G SENSOR HIGH μ OUTPUT —

DIAGNOSIS:

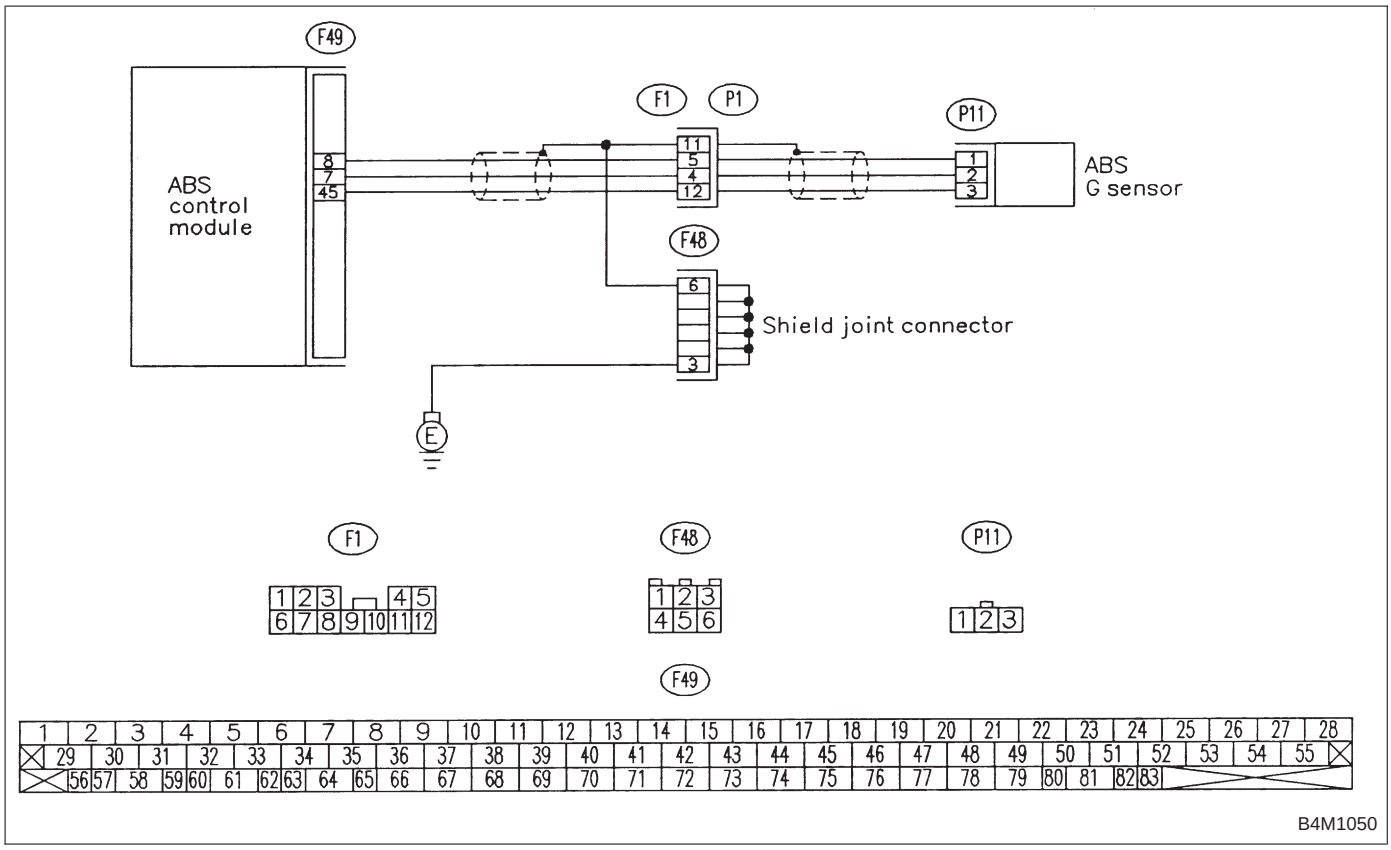
- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.



WIRING DIAGRAM:



G-SENS (F10)
2.30 V

B4M0927

10AJ1	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

1) Press [F], [1] and [0] on the select monitor.
2) Read the select monitor display.

CHECK ***: Is the indicated reading 2.3±0.2 V when the G sensor is in horizontal position?***

YES : Go to step **10AJ2.**

NO : Go to step **10AJ5.**

10AJ2	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.

CHECK ***: Is there poor contact in connector between ABSCM and G sensor?***

YES : Repair connector.

NO : Go to step **10AJ3.**

10AJ3	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

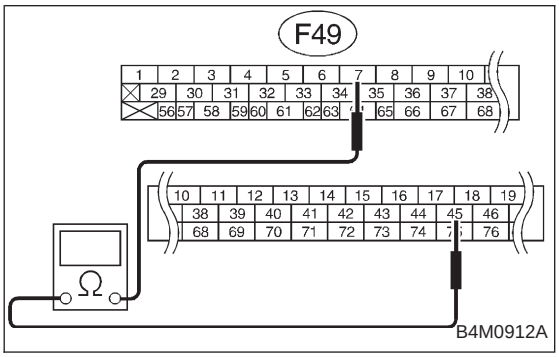
YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



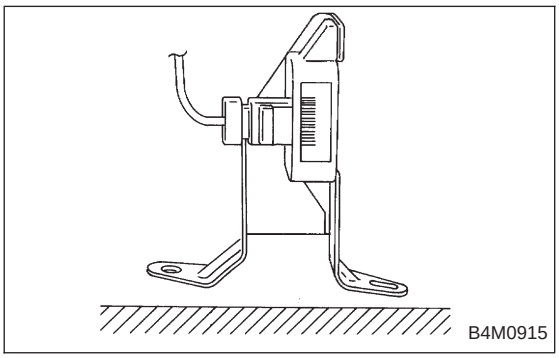
10AJ4	CHECK BROKEN WIRE IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM.
3) Measure resistance between ABSCM connector terminals.

CHECK ***: Connector & terminal (F49) No. 7 — No. 45 Is resistance 4.6±0.3 kΩ?***

YES : Go to step **10AJ5.**

NO : Repair harness between G sensor and ABSCM.



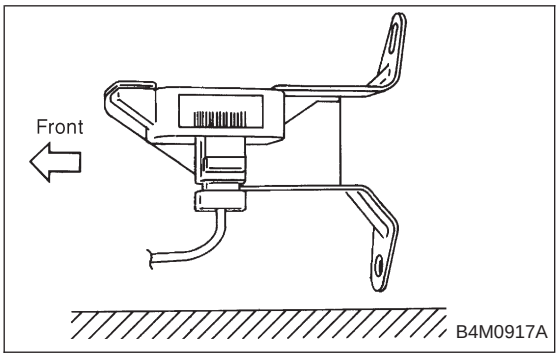
10AJ5	CHECK G SENSOR.

1) Remove console box.
2) Remove G sensor from vehicle.
3) Connect connector to G sensor.
4) Connect connector to ABSCM.
5) Turn ignition switch to ON.
6) Measure voltage between G sensor connector terminals.

CHECK : ***Connector & terminal (P11) No. 2 (+) — No. 1 (−) Is voltage 2.3±0.2 V when G sensor is horizontal?***

YES : Go to next CHECK .

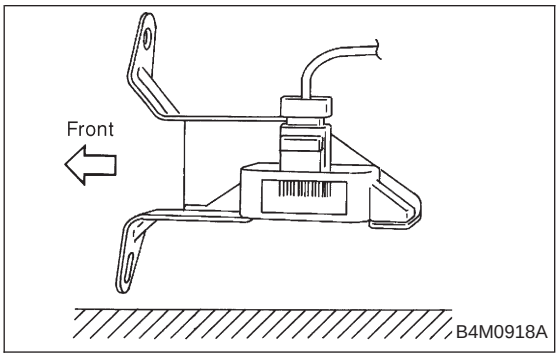
NO : Replace G sensor.



CHECK : ***Connector & terminal (P11) No. 2 (+) — No. 1 (−) Is voltage 3.9±0.2 V when G sensor is inclined forwards to 90°?***

YES : Go to next CHECK .

NO : Replace G sensor.



CHECK : ***Connector & terminal (P11) No. 2 (+) — No. 1 (−) Is voltage 0.7±0.2 V when G sensor is inclined backwards to 90°?***

YES : Go to step **10AJ6.**

NO : Replace G sensor.

10AJ6	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

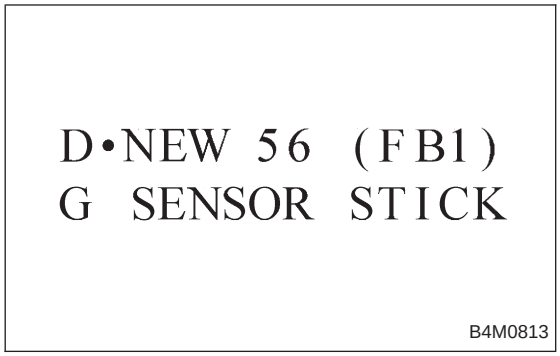
YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



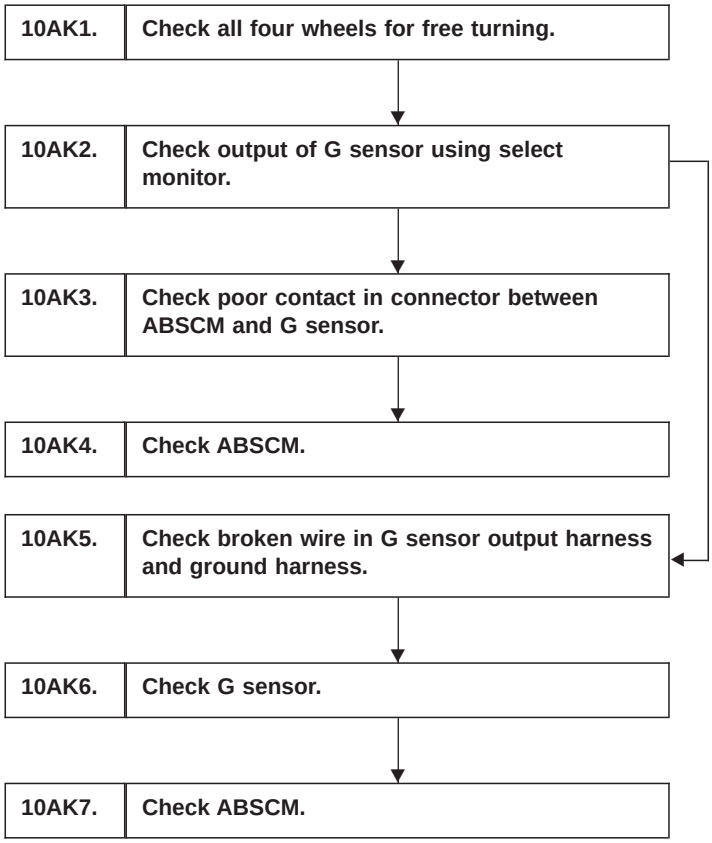
AK: 56 G SENSOR STICK — G SENSOR OUTPUT IS STUCK. —

DIAGNOSIS:

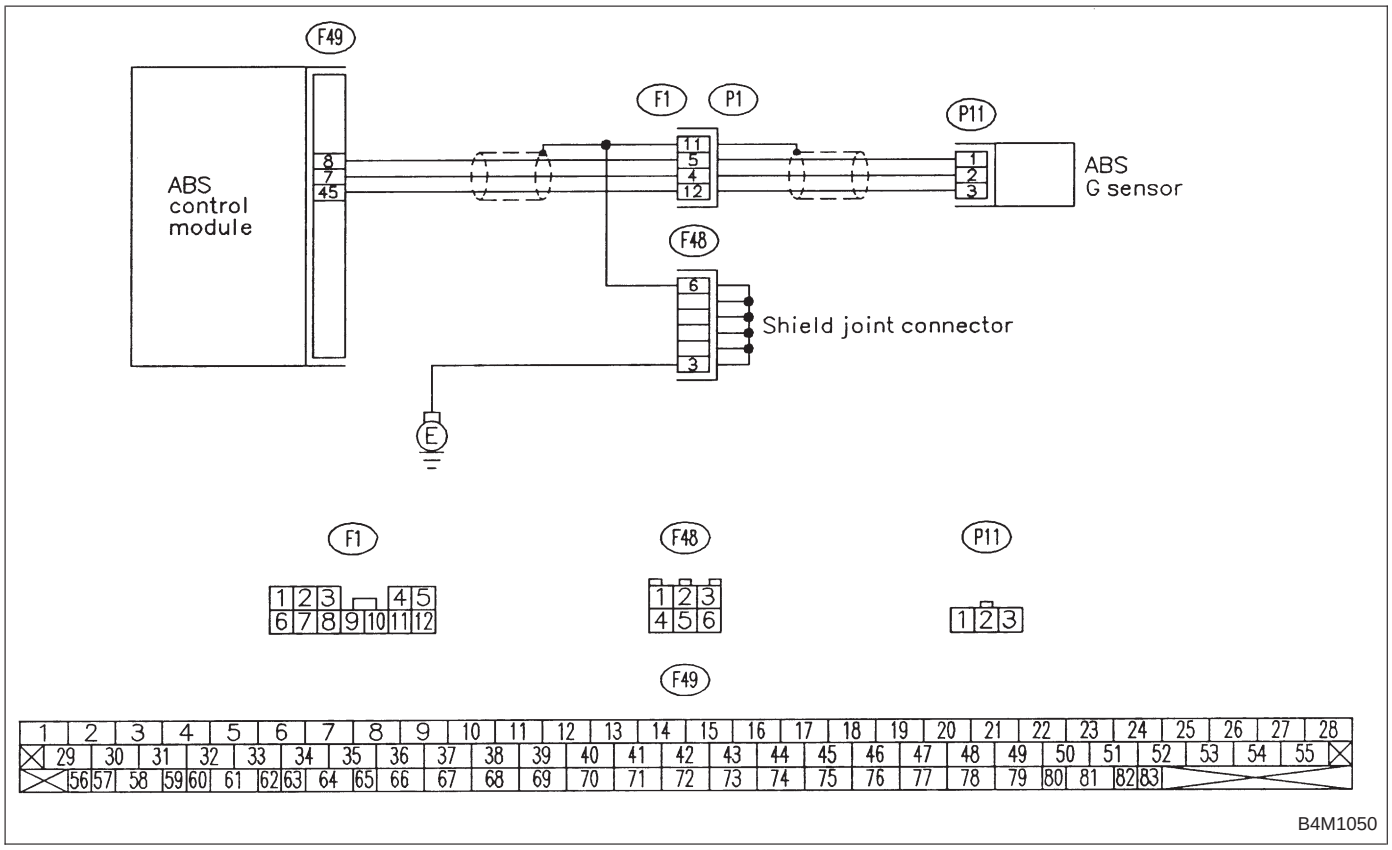
- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.



WIRING DIAGRAM:

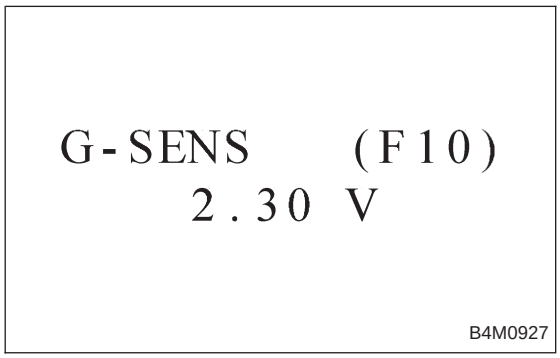


10AK1	CHECK ALL FOUR WHEELS FOR FREE TURNING.

CHECK : ***Have the wheels been turned freely such as when the vehicle is lifted up, or operated on a rolling road?***

YES : The ABS is normal. Erase the trouble code.

NO : Go to step **10AK2.**



10AK2	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

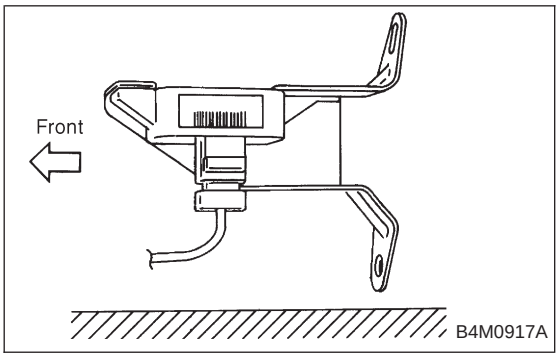
1) Press F , 1 and 0 on the select monitor.
2) Read the select monitor display.

CHECK : ***Is the indicated reading 2.3±0.2 V when the vehicle is in horizontal position?***

YES : Go to next step.

NO : Go to step **10AK5.**

3) Remove console box.
4) Remove G sensor from vehicle. (Do not disconnect connector.)

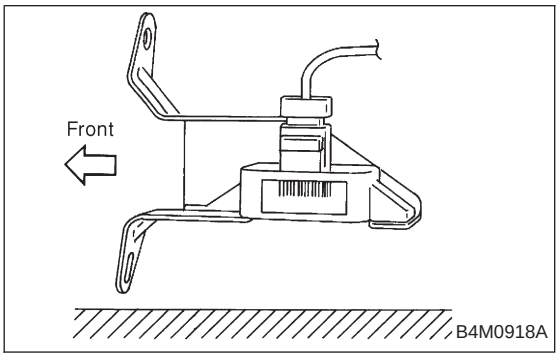


5) Read the select monitor display.

CHECK ***: Is the indicated reading 3.9±0.2 V when G sensor is inclined forwards to 90°?***

YES : Go to next CHECK .

NO : Replace G sensor.



CHECK ***: Is the indicated reading 0.7±0.2 V when G sensor is inclined backwards to 90°?***

YES : Go to step **10AK3.**

NO : Replace G sensor.

10AK3	**CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.**

CHECK ***: Is there poor contact in connector between ABSCM and G sensor?***

YES : Repair connector.

NO : Go to step **10AK4.**

10AK4	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

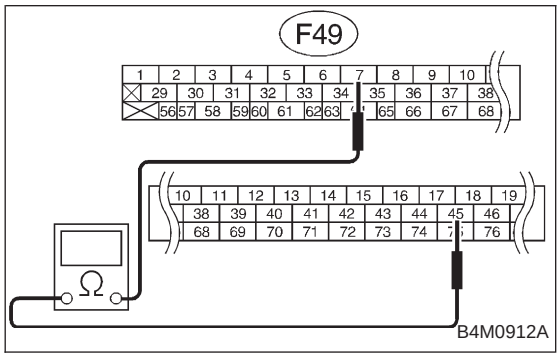
YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



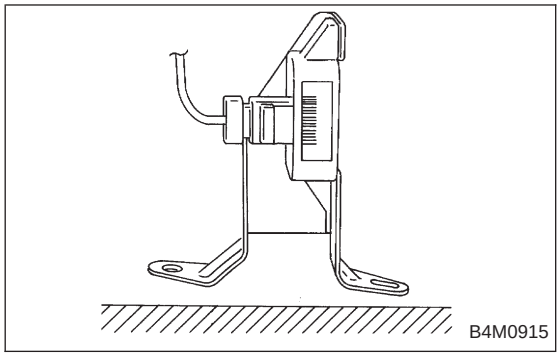
10AK5	CHECK BROKEN WIRE IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM.
3) Measure resistance between ABSCM connector terminals.

CHECK ***: Connector & terminal***
(F49) No. 7 — No. 45
Is resistance 4.6±0.3 kΩ?

YES : Go to step **10AK6.**

NO : Repair harness between G sensor and ABSCM.



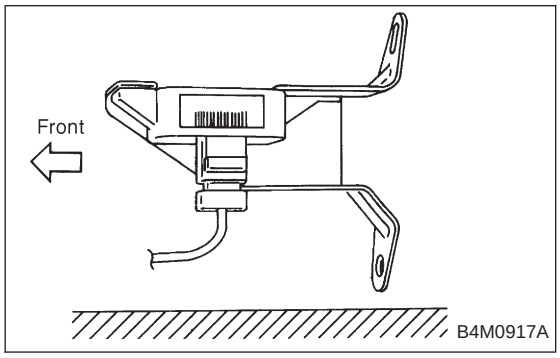
10AK6	CHECK G SENSOR.

1) Remove console box.
2) Remove G sensor from vehicle.
3) Connect connector to G sensor.
4) Connect connector to ABSCM.
5) Turn ignition switch to ON.
6) Measure voltage between G sensor connector terminals.

CHECK : ***Connector & terminal (P11) No. 2 (+) — No. 1 (−) Is voltage 2.3±0.2 V when G sensor is horizontal?***

YES : Go to next CHECK .

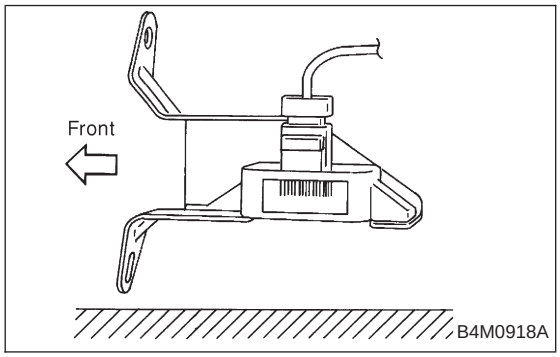
NO : Replace G sensor.



CHECK : ***Connector & terminal (P11) No. 2 (+) — No. 1 (−) Is voltage 3.9±0.2 V when G sensor is inclined forwards to 90°?***

YES : Go to next CHECK .

NO : Replace G sensor.



CHECK : ***Connector & terminal (P11) No. 2 (+) — No. 1 (−) Is voltage 0.7±0.2 V when G sensor is inclined backwards to 90°?***

YES : Go to step **10AK7.**

NO : Replace G sensor.

10AK7	CHECK ABSCM.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM.

NO : Go to next CHECK .

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

11. General Diagnostics Table

A: SYMPTOMS AND PROBABLE CAUSES

Symptom		Probable faulty units/parts
Vehicle instability during braking	Vehicle pulls to either side.	● Hydraulic unit (solenoid valve) ● ABS sensor ● Brake (caliper & piston, pads) ● Wheel alignment ● Tire specifications, tire wear and air pressures ● Incorrect wiring or piping connections ● Road surface (uneven, camber)
	Vehicle spins.	● Hydraulic unit (solenoid valve) ● ABS sensor ● Brake (pads) ● Tire specifications, tire wear and air pressures ● Incorrect wiring or piping connections
Poor braking	Long braking/stopping distance	● Hydraulic unit (solenoid valve) ● Brake (pads) ● Air in brake line ● Tire specifications, tire wear and air pressures ● Incorrect wiring or piping connections
	Wheel locks.	● Hydraulic unit (solenoid valve, motor) ● ABS sensor ● Incorrect wiring or piping connections
	Brake dragging	● Hydraulic unit (solenoid valve) ● ABS sensor ● Master cylinder ● Brake (caliper & piston) ● Parking brake ● Axle & wheels ● Brake pedal play
	Long brake pedal stroke	● Air in brake line ● Brake pedal play
	Vehicle pitching	● Suspension play or fatigue (reduced damping) ● Incorrect wiring or piping connections ● Road surface (uneven)
	Unstable or uneven braking	● Hydraulic unit (solenoid valve) ● ABS sensor ● Brake (caliper & piston, pads) ● Tire specifications, tire wear and air pressures ● Incorrect wiring or piping connections ● Road surface (uneven)
Vibration and/or noise (while driving on slippery roads)	Excessive pedal vibration	● Incorrect wiring or piping connections ● Road surface (uneven)
	Noise from hydraulic unit	● Hydraulic unit (mount bushing) ● ABS sensor ● Brake piping
	Noise from front of vehicle	● Hydraulic unit (mount bushing) ● ABS sensor ● Master cylinder ● Brake (caliper & piston, pads, rotor) ● Brake piping ● Brake booster & check valve ● Suspension play or fatigue
	Noise from rear of vehicle	● ABS sensor ● Brake (caliper & piston, pads, rotor) ● Parking brake ● Brake piping ● Suspension play or fatigue

B: CHECKING THE HYDRAULIC UNIT OPERATION

<Ref. to 4-4 [W22C1] or [W22C2].>
1) Do ABS sequence control patterns take place in correct order?
If not, check wiring and piping for incorrect connections.
2) Are oil pressure or braking force variations within specifications?
If not, check master cylinder, brake piping, hydraulic unit, proportioning valve and wheel cylinder for improper operation.
3) Does pedal hardness change before and after ABS sequence control?
If so, bleed air from brake line.

1. Supplemental Restraint System “Airbag”

Airbag system wiring harness is routed near the ABS sensor, ABS control module and hydraulic control unit.

CAUTION:
● All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
● Be careful not to damage Airbag system wiring harness when servicing the ABS sensor, ABS control module and hydraulic control unit.

2. Pre-inspection

Before performing diagnostics, check the following items which might affect ABS problems:

A: MECHANICAL INSPECTION

1. POWER SUPPLY

1) Measure battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V, or more
Specific gravity: Above 1.260

2) Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

2. BRAKE FLUID

1) Check brake fluid level.
2) Check brake fluid leakage.

3. BRAKE DRAG

Check brake drag. <Ref. to 4-4 [K100].>

4. BRAKE PAD AND ROTOR

Check brake pad and rotor. <Ref. to 4-4 [K100].>

5. TIRE SPECIFICATIONS, TIRE WEAR AND AIR PRESSURE

Check tire specifications, tire wear and air pressure. <Ref. to 4-2 [S1A1], 4-2 [S1A2].>

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Check brake drag. <Ref. to 4-4 [K100].>

4. BRAKE PAD AND ROTOR

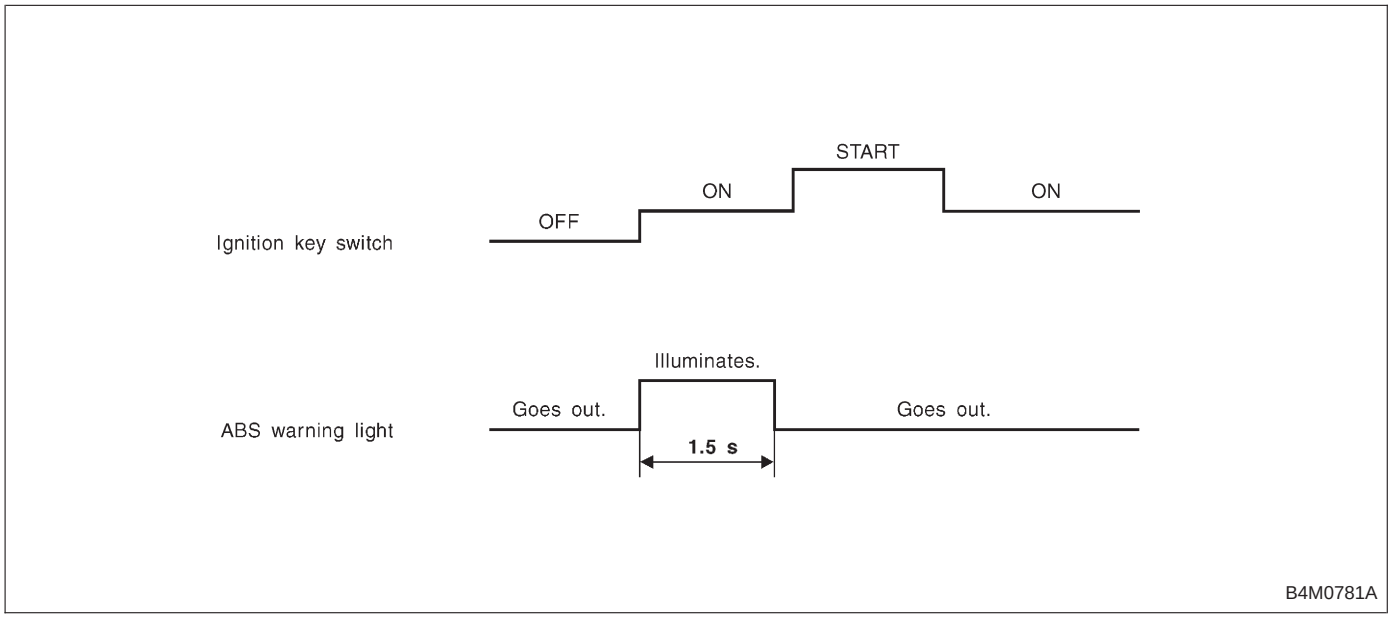
Check brake pad and rotor. <Ref. to 4-4 [K100].>

5. TIRE SPECIFICATIONS, TIRE WEAR AND AIR PRESSURE

Check tire specifications, tire wear and air pressure. <Ref. to 4-2 [S1A1], 4-2 [S1A2].>

B: ELECTRICAL INSPECTION

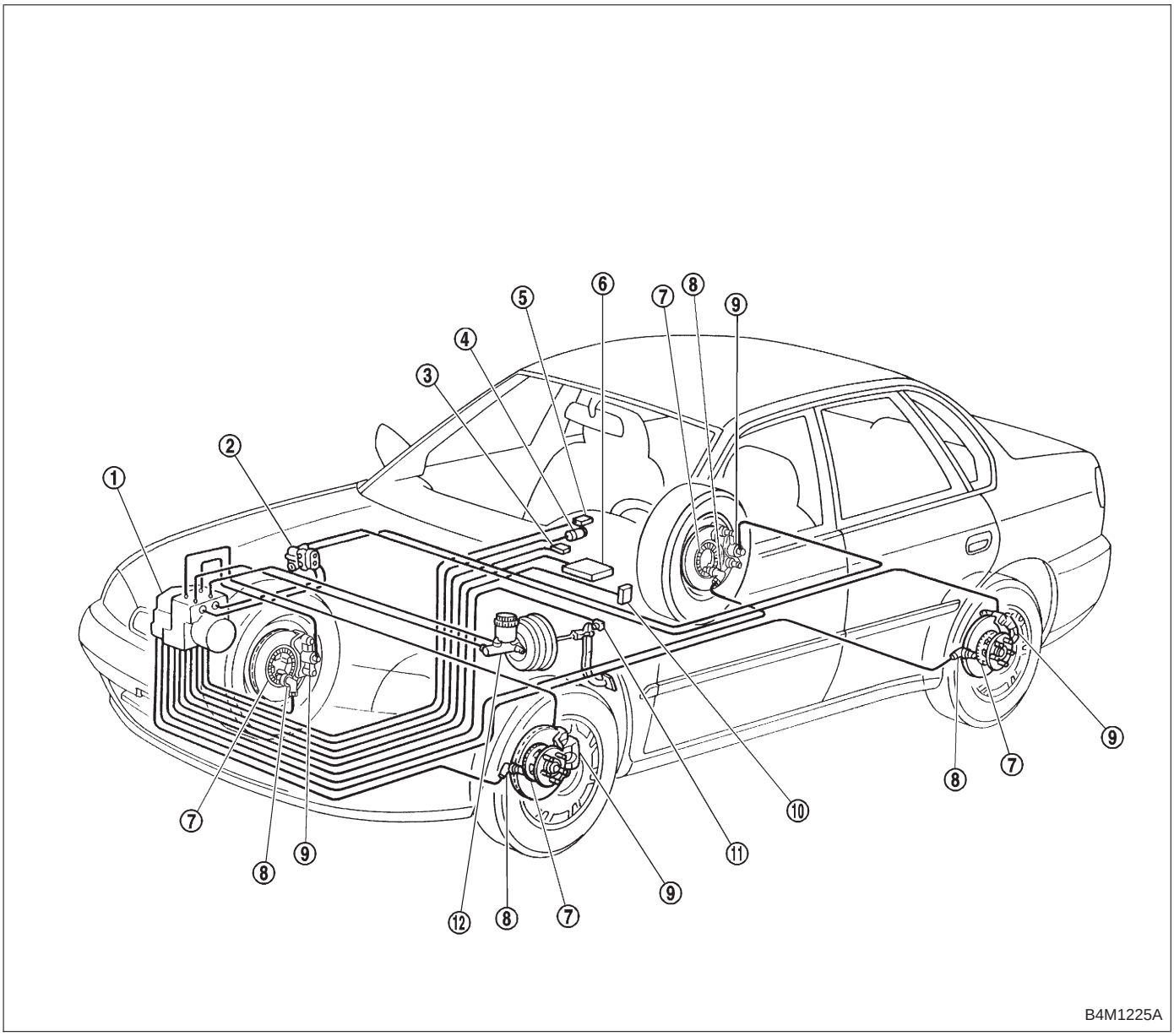
1. WARNING LIGHT ILLUMINATION PATTERN



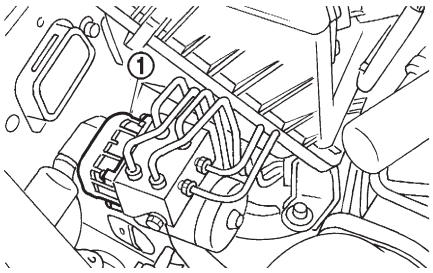
1) When the ABS warning light does not illuminate in accordance with this illumination pattern, there must be an electrical malfunction.
2) When the ABS warning light remains constantly OFF, repair the ABS warning light circuit or diagnosis circuit. <Ref. to 4-4d [T7A0].>

NOTE:
Even though the ABS warning light does not go out 1.5 seconds after it illuminates, the ABS system operates normally when the warning light goes out while driving at approximately 12 km/h (7 MPH). However, the Anti-lock brakes do not work while the ABS warning light is illuminated.

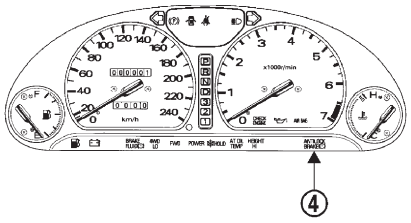
3. Electrical Components Location



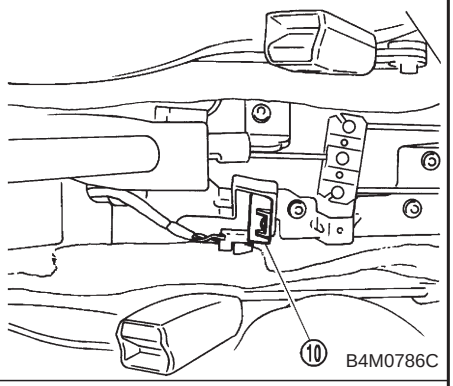
① ABS control module and hydraulic control unit (ABSCM&H/U)
② Proportioning valve
③ Diagnosis connector
④ ABS warning light
⑤ Data link connector (for Subaru select monitor)
⑥ Transmission control module (only AT vehicle)
⑦ Tone wheel
⑧ ABS sensor
⑨ Wheel cylinder
⑩ G sensor (only AWD vehicle)
⑪ Brake switch
⑫ Master cylinder



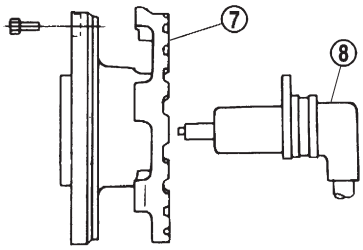
B4M1226A



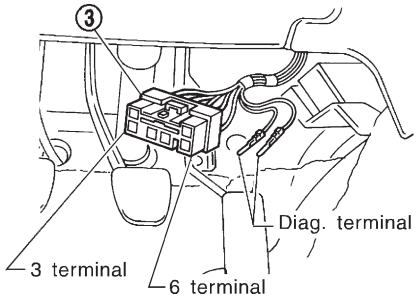
B4M0230D



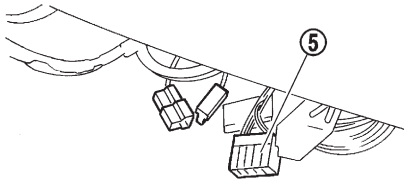
B4M0786C



B4M0646D

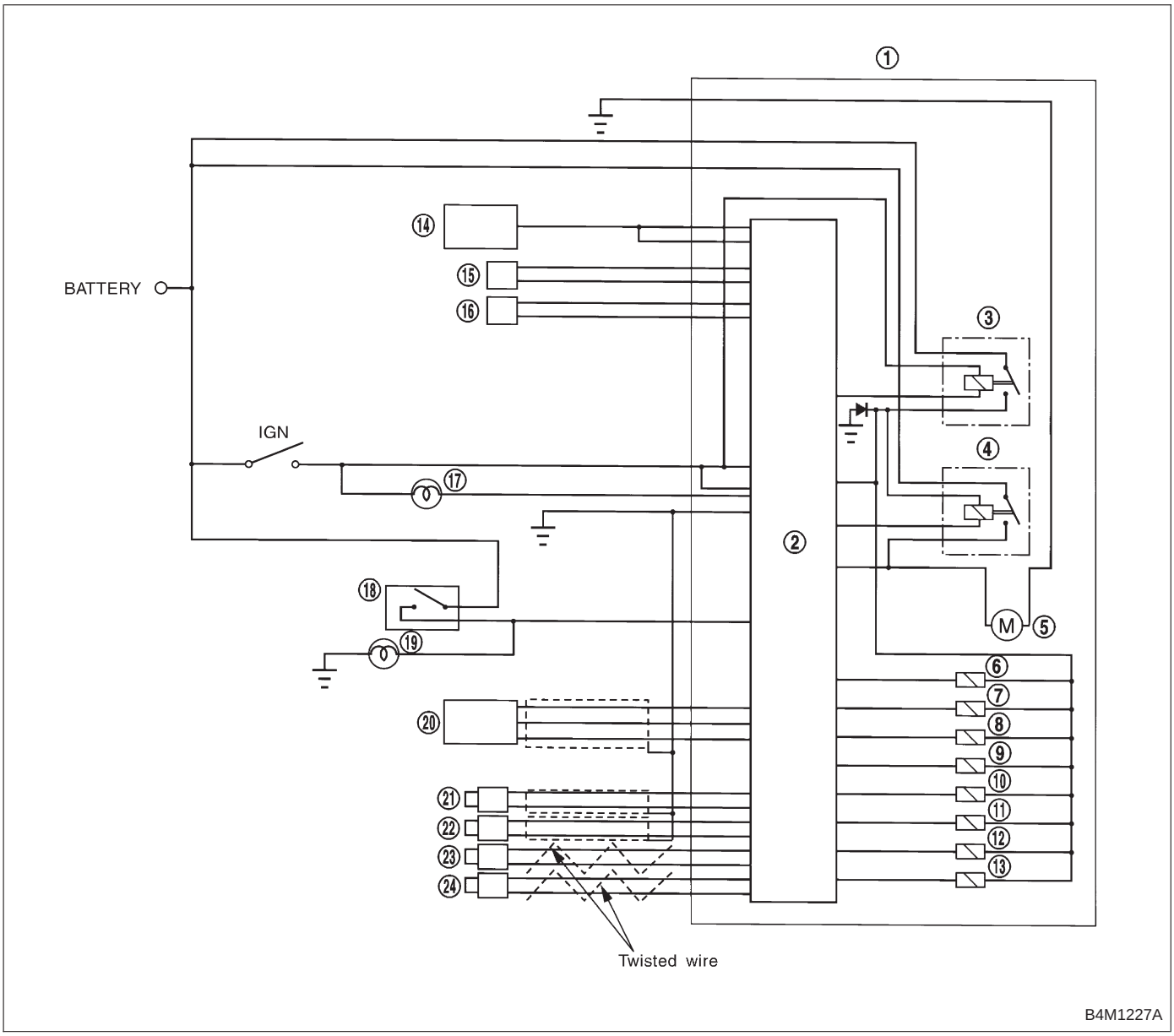


B4M0231D



B4M0645D

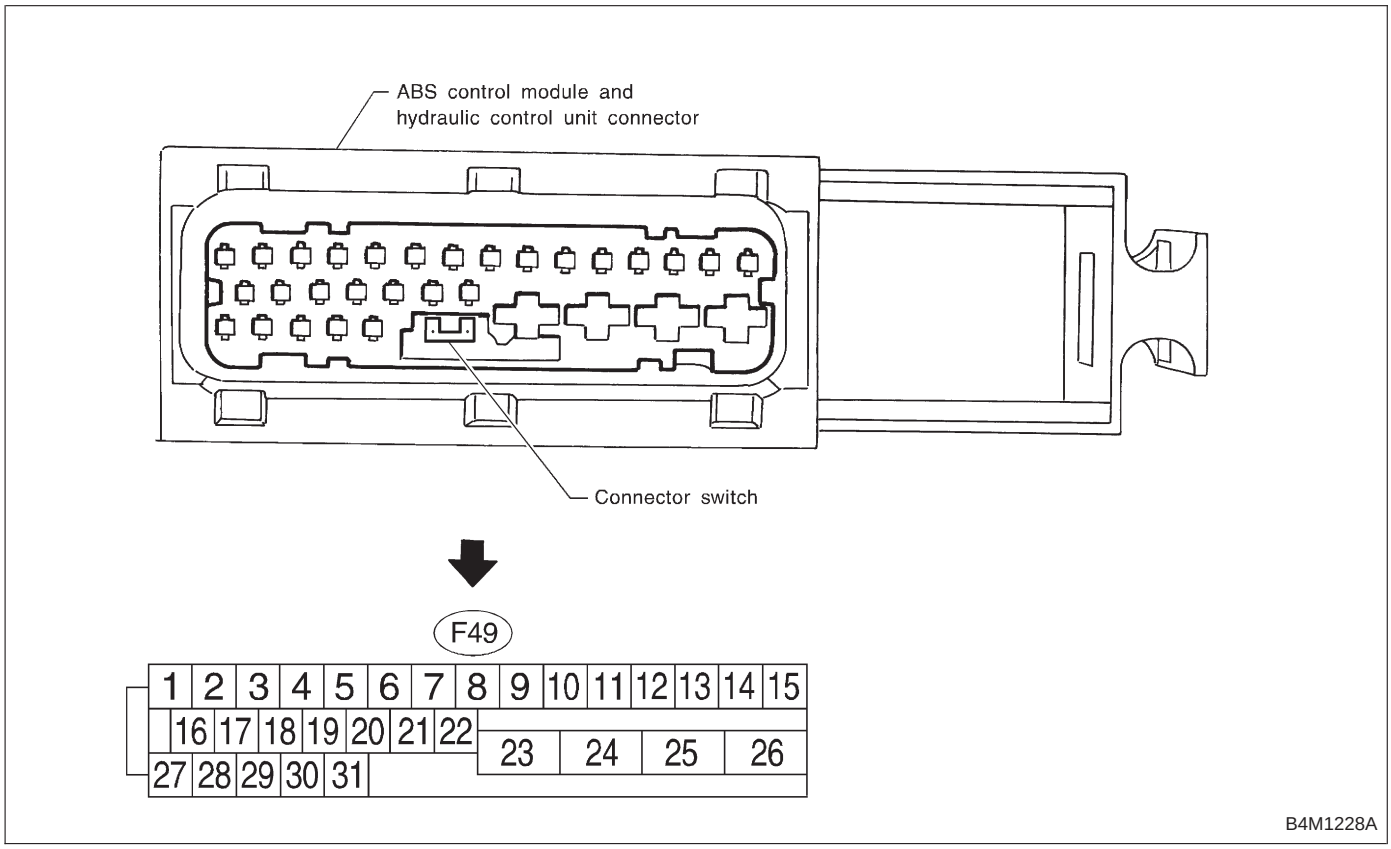
4. Schematic



① ABS control module and hydraulic control unit (ABSCM&H/U)
② ABS control module area
③ Valve relay
④ Motor relay
⑤ Motor
⑥ Front left inlet solenoid valve
⑦ Front left outlet solenoid valve
⑧ Front right inlet solenoid valve
⑨ Front right outlet solenoid valve
⑩ Rear left inlet solenoid valve
⑪ Rear left outlet solenoid valve
⑫ Rear right inlet solenoid valve
⑬ Rear right outlet solenoid valve
⑭ Transmission control module (only AT model)
⑮ Diagnosis connector
⑯ Data link connector
⑰ ABS warning light
⑱ Stop light switch
⑲ Stop light
⑳ G sensor (only AWD model)
㉑ Front left ABS sensor
㉒ Front right ABS sensor
㉓ Rear left ABS sensor
㉔ Rear right ABS sensor

5. Control Module I/O Signal

1. I/O SIGNAL VOLTAGE

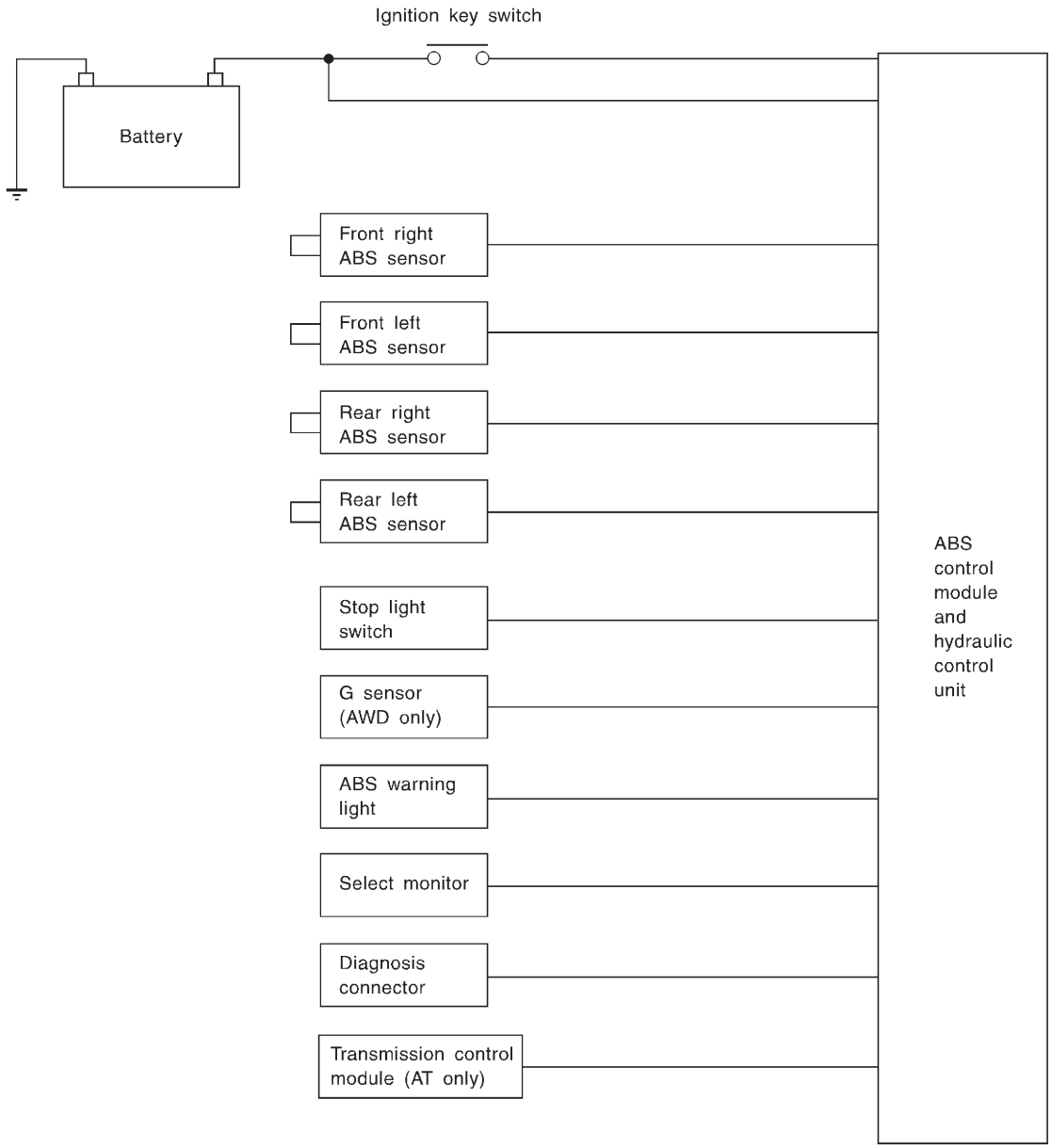


NOTE:
- The terminal numbers in the ABS control module and hydraulic control unit connector are as shown in the figure.
- When the connector is removed from the ABSCM&H/U, the connector switch closes the circuit between terminal No. 21 and No. 23. The ABS warning light illuminates.

Contents		Terminal No. (+)—(−)	Input/Output signal Measured value and measuring conditions
ABS sensor*2 (Wheel speed sensor)	Front left wheel	9—10	0.12 — 1 V (When it is 20 Hz.)
	Front right wheel	11—12	
	Rear left wheel	7—8	
	Rear right wheel	14—15	
Valve relay power supply		24—23	10 — 15 V when ignition switch is ON.
Motor relay power supply		25—23	10 — 15 V when ignition switch is ON.
G sensor*2 (AWD model only)	power supply	30—28	4.75 — 5.25 V
	ground	28	—
	output	6—28	2.3±0.2 V when vehicle is in horizontal position.
Stop light switch*1		2—23	Less than 1.5 V when the stop light is OFF and, 10 — 15 V when the stop light is ON.
ABS warning light*2		21—23	Less than 1.5 V during 1.5 seconds when ignition switch is ON, and 10 — 15 V after 1.5 seconds.
AT ABS signal*2 (AT model only)		31—23	Less than 1.5 V when the ABS control does not operate still and more than 5.5 V when ABS operates.
ABS operation signal monitor*2		3—23	Less than 1.5 V when the ABS control does not operate still and more than 5.5 V when ABS operates.
Select monitor*2	Data is received.	20—23	Less than 1.5 V when no data is received.
	Data is sent.	5—23	4.75 — 5.25 V when no data is sent.
ABS diagnosis connector*2	Terminal No. 3	29—23	10 — 15 V when ignition switch is ON.
	Terminal No. 6	4—23	10 — 15 V when ignition switch is ON.
Power supply*1		1—23	10 — 15 V when ignition switch is ON.
Grounding line		23	—
Grounding line		26	—

*1: Measure the I/O signal voltage after removing the connector from the ABSCM&H/U terminal.
*2: Measure the I/O signal voltage at connector (F2) or (F1).

2. I/O SIGNAL DIAGRAM



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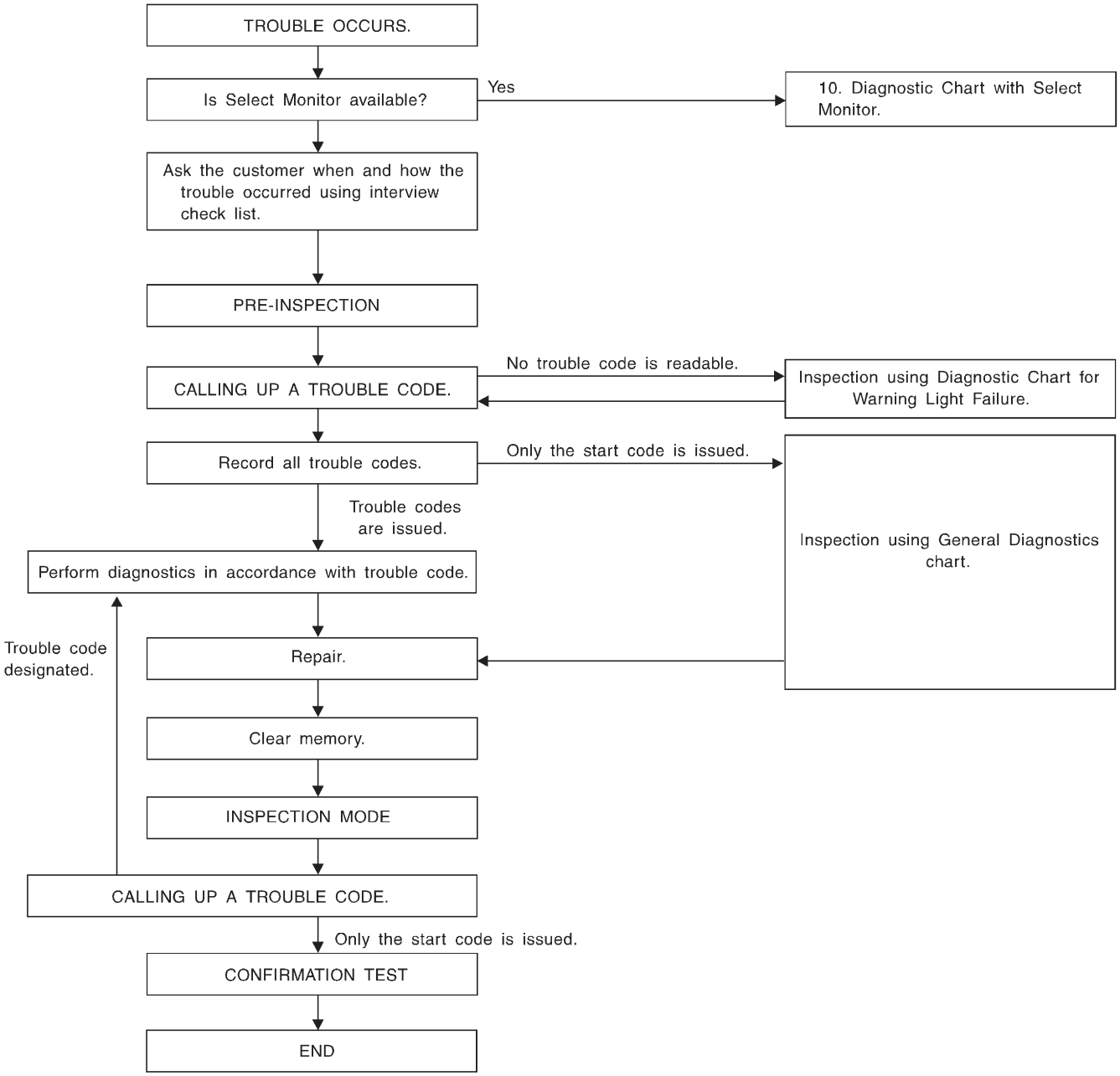
6. Diagnostics Chart for On-board Diagnosis System

A: BASIC DIAGNOSTICS PROCEDURE



B4M1051A

CAUTION:
Remove foreign matter (dust, water, etc.) from the ABSCM&H/U connector during removal and installation.

NOTE:
● To check harness for broken wires or short circuits, shake it while holding it or the connector.

● When ABS warning light illuminates, read and record trouble code indicated by ABS warning light.

B: CHECK LIST FOR INTERVIEW

Check the following items about the vehicle's state.

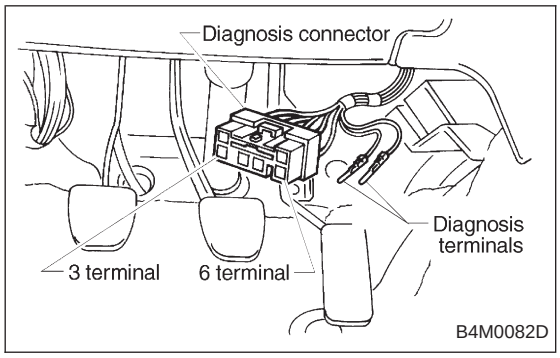
<table>
<tr><td colspan="4">1. THE STATE OF THE ABS WARNING LIGHT</td></tr>
<tr><td>ABS warning light comes on.</td><td colspan="3">☐ Always
☐ Sometimes
☐ Only once
☐ Does not come on
● When /how long does it come on?:</td></tr>
<tr><td>Ignition key position</td><td colspan="3">☐ LOCK
☐ ACC
☐ ON (before starting engine)
☐ START
☐ On after starting (Engine is running)
☐ On after starting (Engine is stop)</td></tr>
<tr><td rowspan="11">Timing</td><td colspan="3">☐ Immediately after ignition is ON.
☐ Immediately after ignition starts.</td></tr>
<tr><td rowspan="2">☐ When advancing</td><td colspan="2">km/h to km/h</td></tr>
<tr><td colspan="2">MPH to MPH</td></tr>
<tr><td>☐ While traveling at a constant speed</td><td>km/h</td><td>MPH</td></tr>
<tr><td rowspan="2">☐ When decelerating</td><td colspan="2">km/h to km/h</td></tr>
<tr><td colspan="2">MPH to MPH</td></tr>
<tr><td rowspan="2">☐When turning to right</td><td>Steering angle :</td><td>deg</td></tr>
<tr><td>Steering time :</td><td>sec</td></tr>
<tr><td rowspan="2">☐ When turning to left</td><td>Steering angle :</td><td>deg</td></tr>
<tr><td>Steering time :</td><td>sec</td></tr>
<tr><td colspan="3">☐ When moving other electrical parts</td></tr>
<tr><td colspan="3">● Parts name :
● Operating condition :</td></tr>
<tr><td colspan="4">2. SYMPTOMS</td></tr>
<tr><td rowspan="8">ABS operating condition</td><td colspan="3">☐ Performs no work.</td></tr>
<tr><td rowspan="2">☐ Operates only when abruptly applying brakes.</td><td rowspan="2">Vehicle speed :</td><td>km/h</td></tr>
<tr><td>MPH</td></tr>
<tr><td colspan="3">● How to step on brake pedal :</td></tr>
<tr><td>a) Operating time :</td><td colspan="2">sec</td></tr>
<tr><td colspan="3">b) Operating noise : ☐ Produce / ☐ Does not produce</td></tr>
<tr><td>● What kind of noise?</td><td colspan="2">☐ Knock
☐ Gong gong
☐ Bong
☐ Buzz
☐ Gong gong buzz
☐ Others :</td></tr>
<tr><td colspan="3">c) Reaction force of brake pedal</td></tr>
<tr><td></td><td colspan="2">☐ Stick
☐ Press down once with a clunk
☐ Press and released
☐ Others :</td></tr>
</table>

Behavior of vehicle	a) Directional stability cannot be obtained or steering arm refuses to work when applying brakes : ☐ Yes / ☐No	
	● When :	☐ Vehicle turns to right ☐ Vehicle turns to left ☐ Spins ☐ Others :
	b) Directional stability cannot be obtained or steering arm refuses to work when accelerating : ☐ Yes / ☐No	
	● When :	☐ Vehicle turns to right ☐ Vehicle turns to left ☐ Spins ☐ Others :
	c) Brakes are out of order : ☐ Yes / ☐No	
	● What :	☐ Braking distance is long ☐ Brakes lock or drag ☐ Pedal stroke is long ☐ Pedal sticks ☐ Others :
	d) Poor acceleration : ☐ Yes / ☐No	
	● What :	☐ Fails to accelerate ☐ Engine stalls ☐ Others :
	e) Occurrence of vibration : ☐ Yes / ☐No	
	● Where ● What kind :	
	f) Occurrence of abnormal noise : ☐ Yes / ☐No	
	● Where ● What kind :	
	g) Occurrence of other phenomena : ☐ Yes / ☐No	
	● What kind :	
3. CONDITIONS UNDER WHICH TROUBLE OCCURS		
Environment	a) Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Others :
	b) Ambient temperature	F(°C)
	c) Road	☐ Urban area ☐ Suburbs ☐ Highway ☐ General road ☐ Ascending slope ☐ Descending slope ☐ Paved road ☐ Gravel road ☐ Muddy road ☐ Sandy place ☐ Others :
	d) Road surface	☐ Dry ☐ Wet ☐ New-fallen snow ☐ Compressed snow ☐ Frozen slope ☐ Others :

Condition	a) Brakes	Deceleration :	g
		☐ Continuous / ☐Intermittent	
	b) Accelerator	Acceleration :	g
		☐ Continuous / ☐ Intermittent	
	c) Vehicle speed	km/h	MPH
		☐ Advancing ☐ Accelerating ☐ Reducing speed ☐ Low speed ☐ Turning ☐ Others :	
	d) Tire inflation pressure	Front RH tire :	kPa
		Front LH tire :	kPa
		Rear RH tire :	kPa
		Rear LH tire :	kPa
	e) Degree of wear	Front RH tire :	
		Front LH tire :	
		Rear RH tire :	
		Rear LH tire :	
	f) Genuine parts are used. : ☐Yes / ☐No		
	g) Chain is passed around tires. : ☐Yes / ☐No		
	h) T tire is used. : ☐Yes / ☐No		
	i) Condition of suspension alignment :		
	j) Loading state :		
	k) Repair parts are used. : ☐Yes / ☐No		
	● What :		
	l) Others :		

C: INSPECTION MODE

Reproduce the condition under which the problem has occurred as much as possible.
Drive the vehicle at a speed more than 40 km/h (25 MPH) for at least one minute.



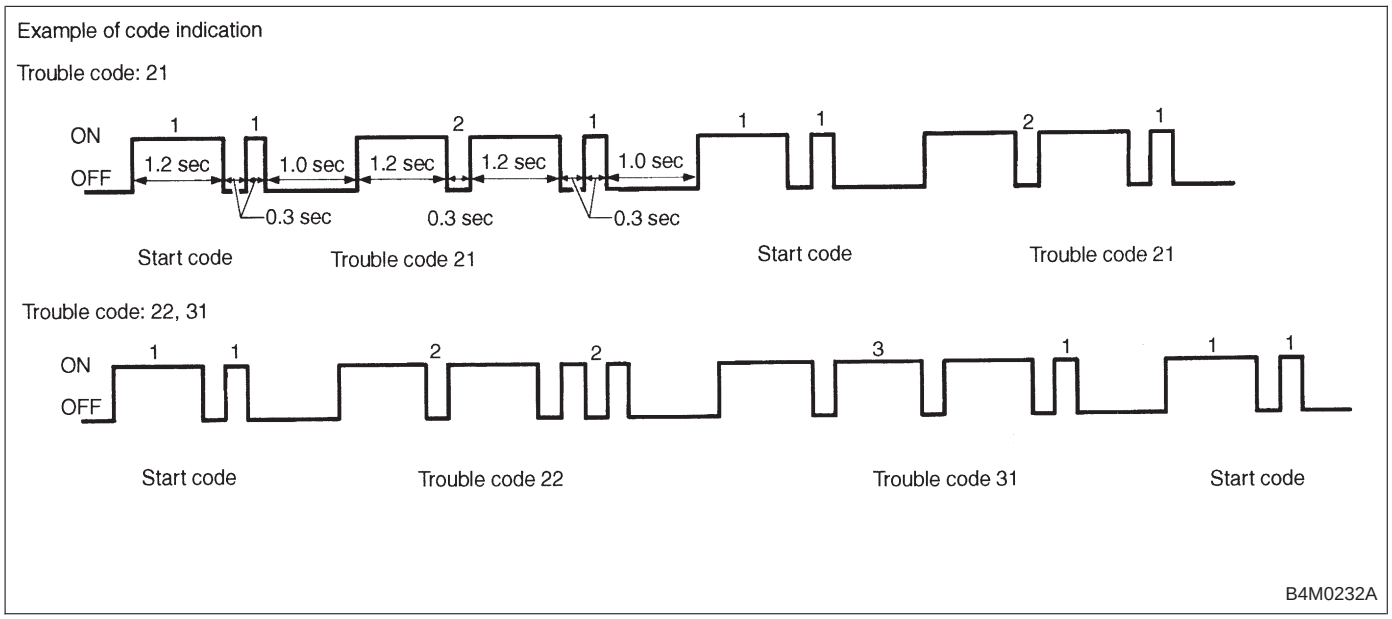
D: TROUBLE CODES

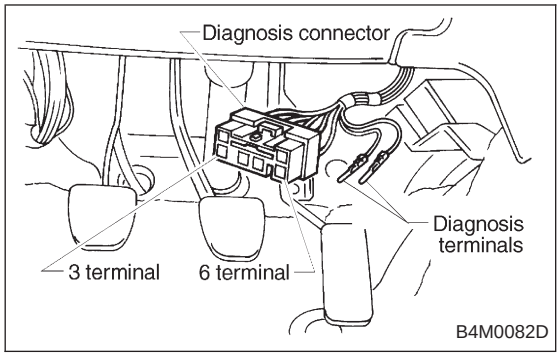
When on-board diagnosis of the ABS control module detects a problem, the information (up to a maximum of three) will be stored in the EEP ROM as a trouble code. When there are more than three, the most recent three will be stored. (Stored codes will stay in memory until they are cleared.)

1. CALLING UP A TROUBLE CODE

1) Take out diagnosis connector from side of driver's seat heater unit.
2) Turn ignition switch OFF.
3) Connect diagnosis connector terminal 6 to diagnosis terminal.
4) Turn ignition switch ON.
5) ABS warning light is set in the diagnostic mode and blinks to identify trouble code.
6) After the start code (11) is shown, the trouble codes will be shown in order of the last information first.
These repeat for a maximum of 5 minutes.

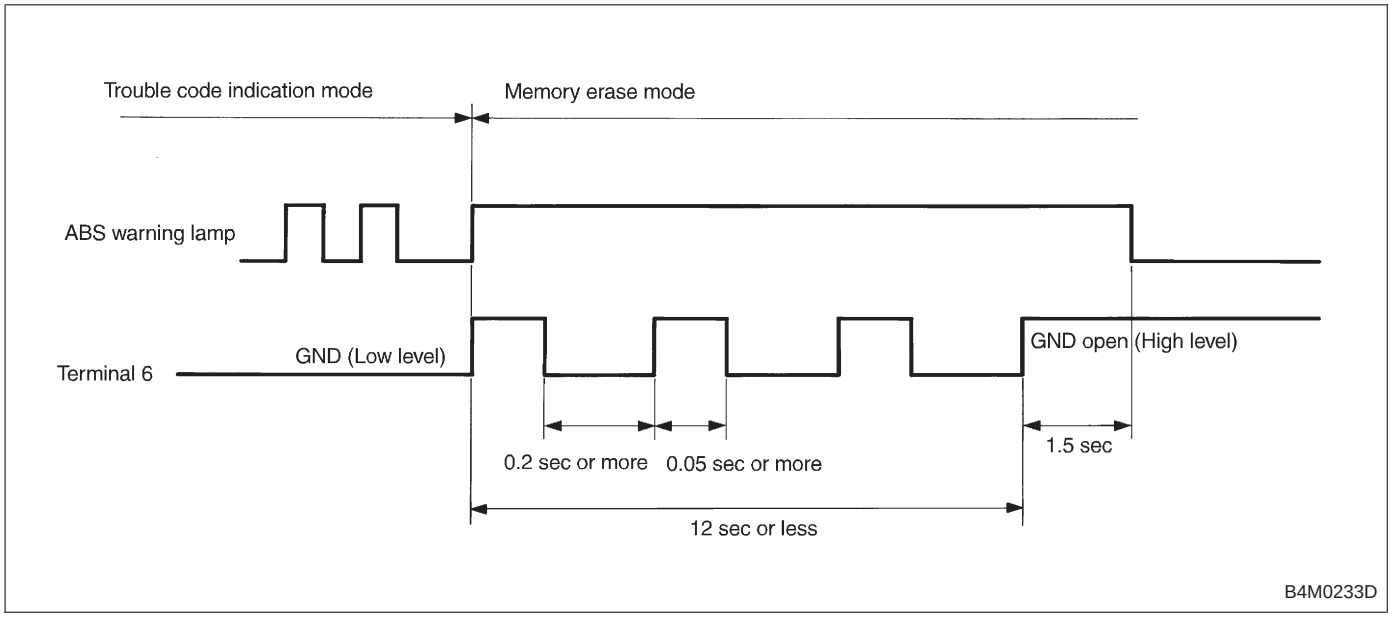
NOTE:
When there are no trouble codes in memory, only the start code (11) is shown.





2. CLEARING MEMORY

1) After calling up a trouble code, disconnect diagnosis connector terminal 6 from diagnosis terminal.
2) Repeat 3 times within approx. 12 seconds; connecting and disconnecting terminal 6 and diagnosis terminal for at least 0.05 seconds each time.



NOTE:
After diagnostics is completed, make sure to clear memory. Make sure only start code (11) is shown after memory is cleared.

7. Diagnostics Chart for ABS Warning Light Circuit and Diagnosis Circuit Failure

A: ABS WARNING LIGHT DOES NOT COME ON.

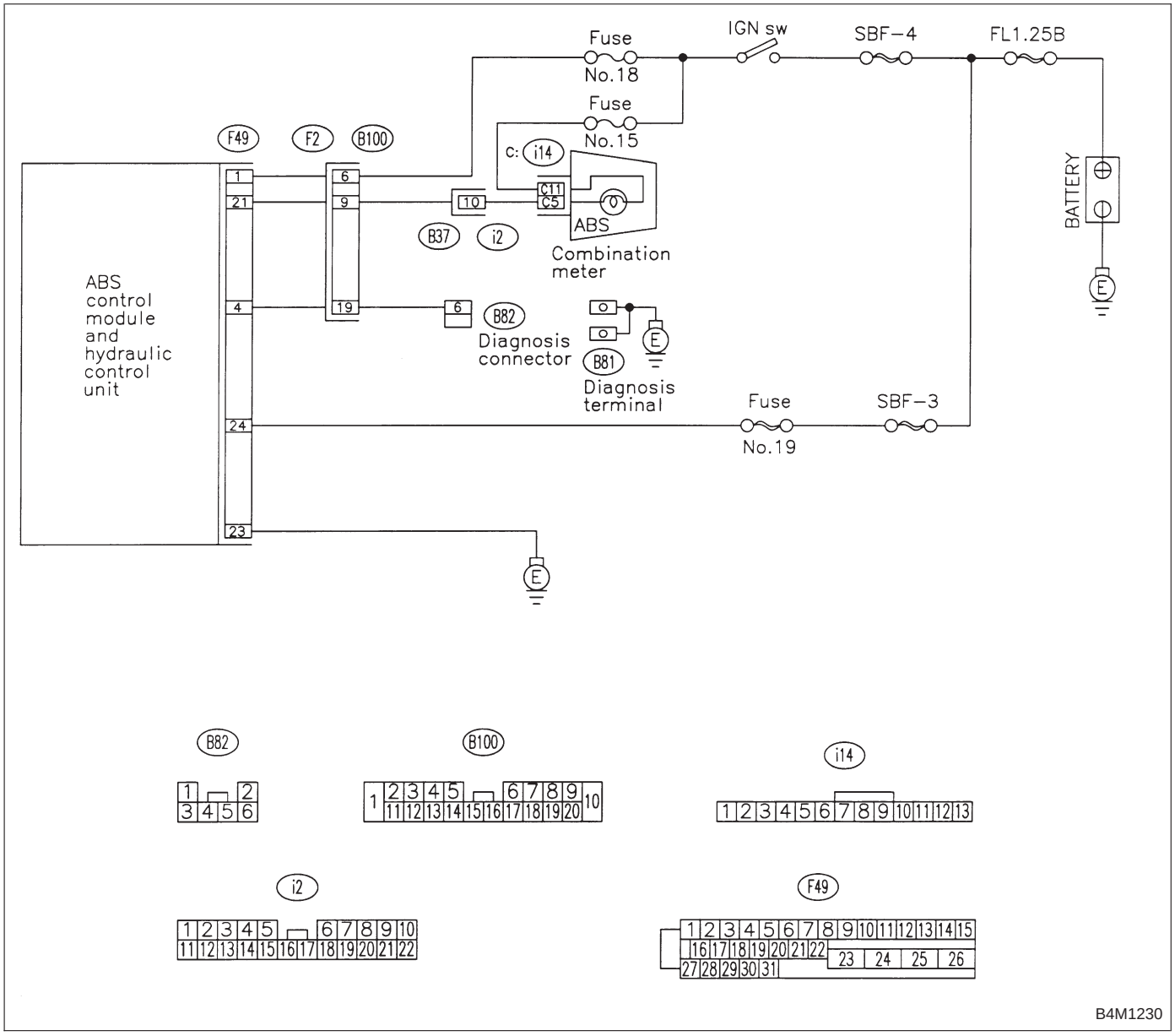
DIAGNOSIS:

- ABS warning light circuit is open or shorted.

TROUBLE SYMPTOM:

- When ignition switch is turned ON (engine OFF), ABS warning light does not come on.

WIRING DIAGRAM:



7A1	CHECK IF OTHER WARNING LIGHTS TURN ON.

Turn ignition switch to ON (engine OFF).

CHECK ***: Do other warning lights turn on?***

YES : Go to step **7A2.**

NO : Repair combination meter.

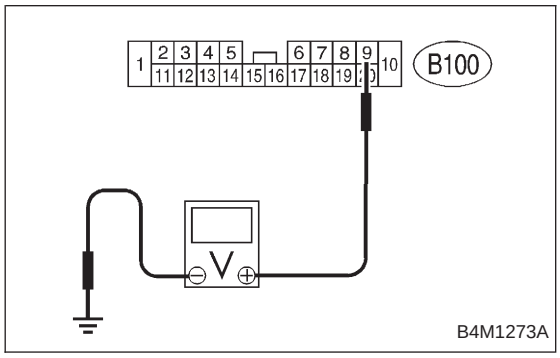
7A2	CHECK ABS WARNING LIGHT BULB.

1) Turn ignition switch to OFF.
2) Remove combination meter.
3) Remove ABS warning light bulb from combination meter.

CHECK ***: Is ABS warning light bulb OK?***

YES : Go to step **7A3.**

NO : Replace ABS warning light bulb.



7A3	CHECK BATTERY SHORT OF ABS WARNING LIGHT HARNESS.

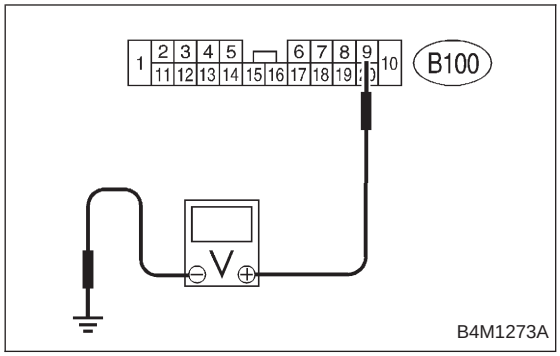
1) Disconnect connector (B100) from connector (F2).
2) Measure voltage between connector (B100) and chassis ground.

Connector & terminal
(B100) No. 9 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 3 V?***

YES : Go to step **7A4**.

NO : Repair warning light harness.



7A4	CHECK BATTERY SHORT OF ABS WARNING LIGHT HARNESS.

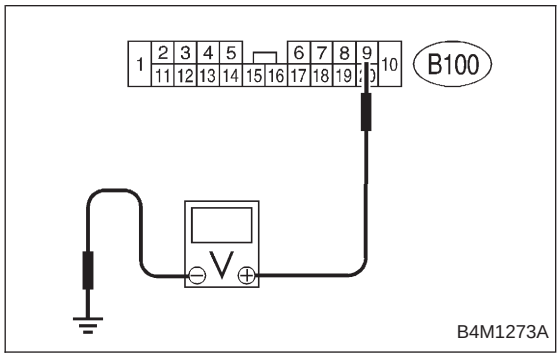
1) Turn ignition switch to ON.
2) Measure voltage between connector (B100) and chassis ground.

Connector & terminal
(B100) No. 9 (+) — Chassis ground (−):

CHECK ***: Is voltage less than 3 V?***

YES : Go to step **7A5**.

NO : Repair warning light harness.



7A5	CHECK WIRING HARNESS.

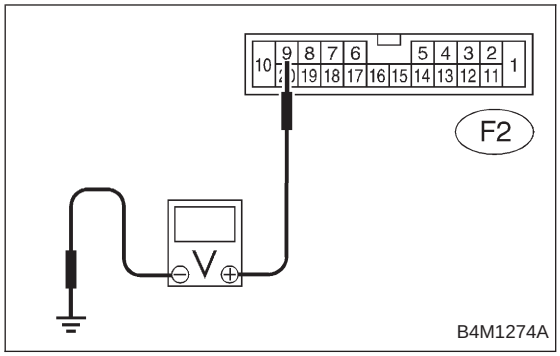
1) Turn ignition switch to OFF.
2) Install ABS warning light bulb from combination meter.
3) Install combination meter.
4) Turn ignition switch to ON.
5) Measure voltage between connector (B100) and chassis ground.

Connector & terminal
(B100) No. 9 (+) — Chassis ground (−):

CHECK ***: Is voltage between 10 V and 15 V?***

YES : Go to step **7A6**.

NO : Repair wiring harness.

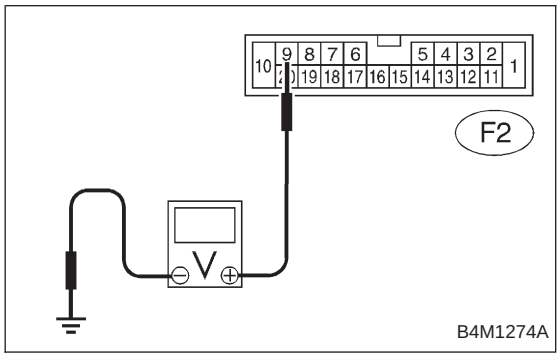


7A6	CHECK BATTERY SHORT OF ABS WARNING LIGHT HARNESS.

1) Turn ignition switch to OFF.
2) Measure voltage between connector (F2) and chassis ground.

Connector & terminal
(F2) No. 9 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 3 V?***
YES : Go to step **7A7**.
NO : Repair wiring harness.

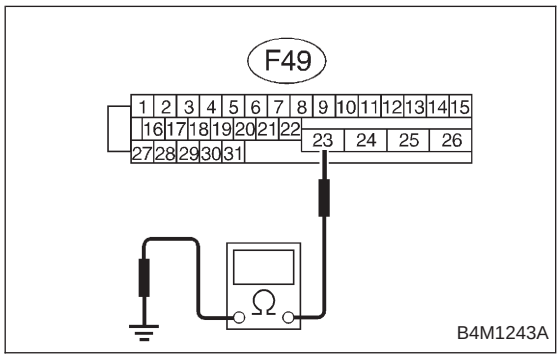


7A7	CHECK BATTERY SHORT OF ABS WARNING LIGHT HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between connector (F2) and chassis ground.

Connector & terminal
(F2) No. 9 (+) — Chassis ground (−):

CHECK ***: Is voltage less than 3 V?***
YES : Go to step **7A8**.
NO : Repair wiring harness.

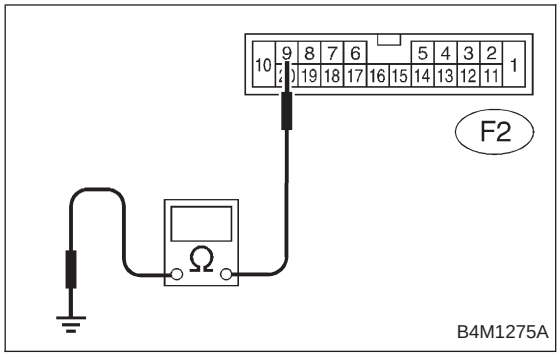


7A8	CHECK GROUND CIRCUIT OF ABSCM&H/U.

Measure resistance between ABSCM&H/U and chassis ground.

Connector & terminal
(F49) No. 23 — GND:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **7A9**.
NO : Repair ABSCM&H/U ground harness.



7A9	CHECK WIRING HARNESS.

Measure resistance between connector (F2) and chassis ground.

Connector & terminal
(F2) No. 9 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **7A10**.

NO : Repair harness/connector.

7A10	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK ***: Is there poor contact in connectors between combination meter and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Replace ABSCM&H/U.

B: ABS WARNING LIGHT DOES NOT GO OFF.

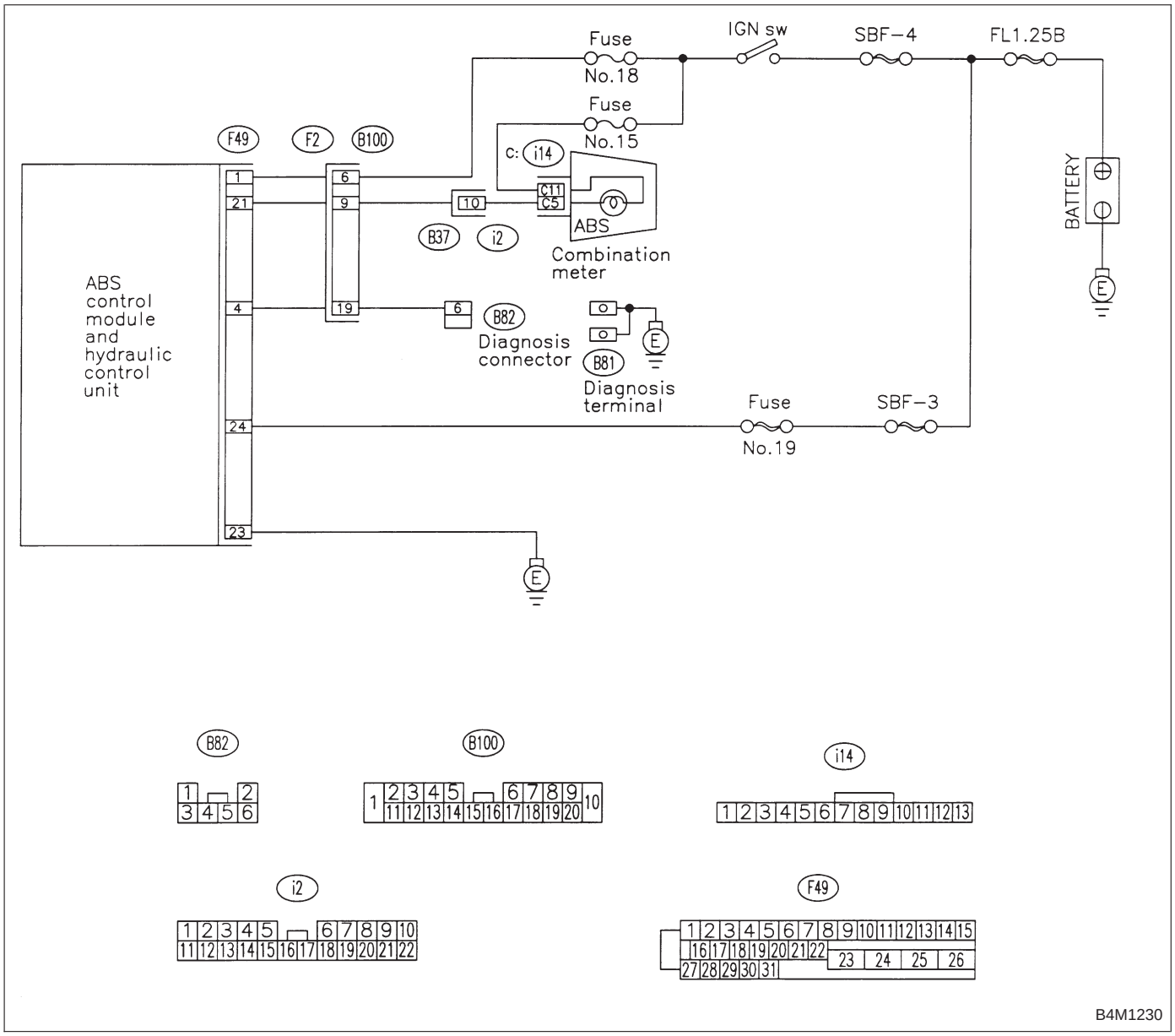
DIAGNOSIS:

- ABS warning light circuit is open or shorted.

TROUBLE SYMPTOM:

- When starting the engine and while ABS warning light is kept ON.

WIRING DIAGRAM:



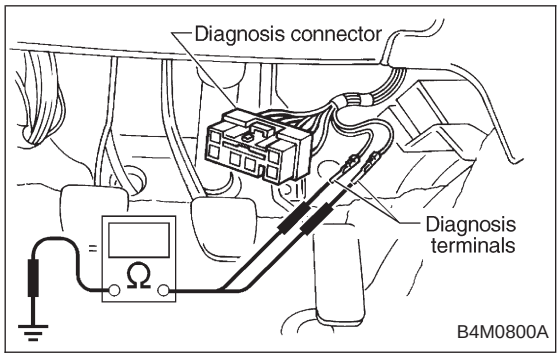
7B1	CHECK INSTALLATION OF ABSCM&H/U CONNECTOR.

Turn ignition switch to OFF.

CHECK ***: Is ABSCM&H/U connector inserted into ABSCM until the clamp locks onto it?***

YES : Go to step **7B2**.

NO : Insert ABSCM&H/U connector into ABSCM&H/U until the clamp locks onto it.



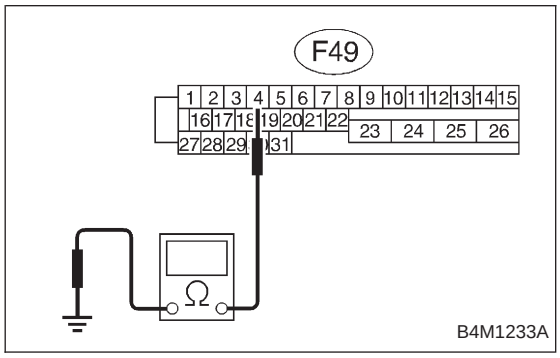
7B2	CHECK DIAGNOSIS TERMINAL.

Measure resistance between diagnosis terminals (B81) and chassis ground.

CHECK ***: Terminals***
Diagnosis terminal (A) — Chassis ground:
Diagnosis terminal (B) — Chassis ground:
Is the resistance less than 0.5 Ω?

YES : Go to step **7B3**.

NO : Repair diagnosis terminal harness.



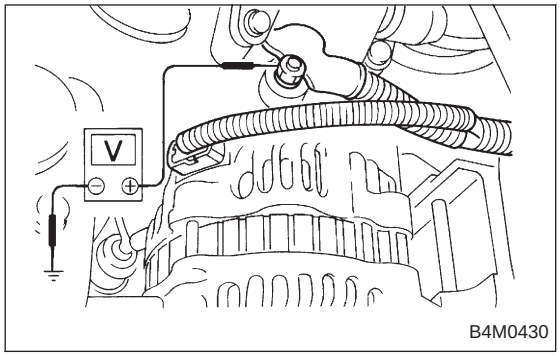
7B3	CHECK DIAGNOSIS LINE.

1) Turn ignition switch to OFF.
2) Connect diagnosis terminal to diagnosis connector (B82) No. 6.
3) Disconnect connector from ABSCM&H/U.
4) Measure resistance between ABSCM&H/U connector and chassis ground.

CHECK ***: Connector & terminal***
(F49) No. 4 — Chassis ground:
Is the resistance less than 0.5 Ω?

YES : Go to step **7B4**.

NO : Repair harness connector between ABSCM&H/U and diagnosis connector.



7B4	CHECK GENERATOR.

1) Start the engine.
2) Idle the engine.
3) Measure voltage between generator and chassis ground.

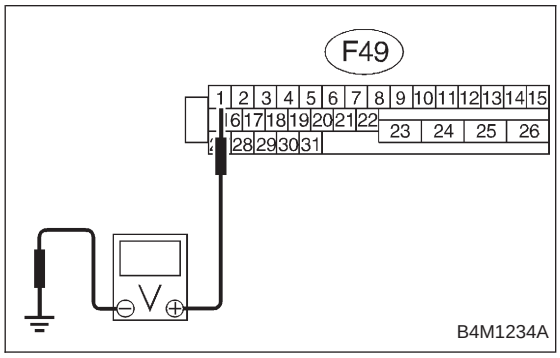
Terminal
Generator B terminal (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 and 15 V?***
YES : Go to step **7B5**.
NO : Repair generator.

7B5	CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

CHECK ***: Is there poor contact at battery terminal?***
YES : Repair battery terminal.
NO : Go to step **7B6**.



7B6	CHECK POWER SUPPLY OF ABSCM.

1) Disconnect connector from ABSCM&H/U.
2) Start engine.
3) Idle the engine.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

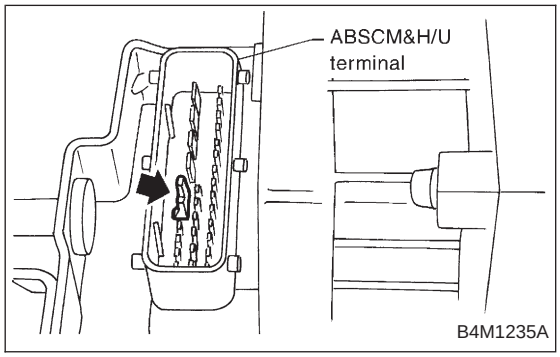
Connector & terminal
(F49) No. 1 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 and 15 V?***
YES : Go to step **7B7**.
NO : Repair ABSCM&H/U power supply circuit.

7B7	CHECK WIRING HARNESS.

1) Disconnect connector (F2) from connector (B100).
2) Turn ignition switch to ON.

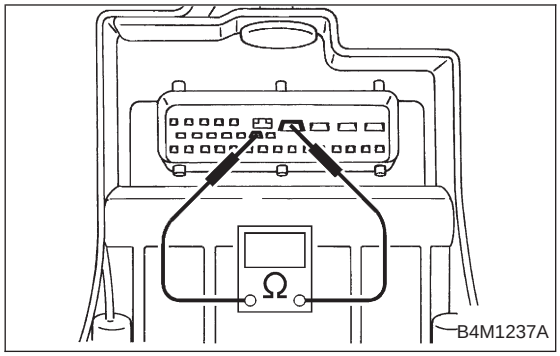
CHECK ***: Does the ABS warning light remain off?***
YES : Go to step **7B8**.
NO : Repair front wiring harness.



7B8	CHECK PROJECTION AT ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Check for broken projection at the ABSCM&H/U terminal.

CHECK ***: Are the projection broken?***
YES : Go to step **7B9**.
NO : Replace ABSCM&H/U.

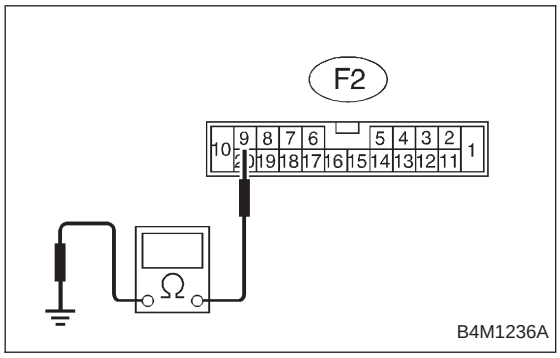


7B9	CHECK ABSCM&H/U.

Measure resistance between ABSCM&H/U terminals.

Terminals
No. 21 — No. 23:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **7B10**.
NO : Replace ABSCM&H/U.

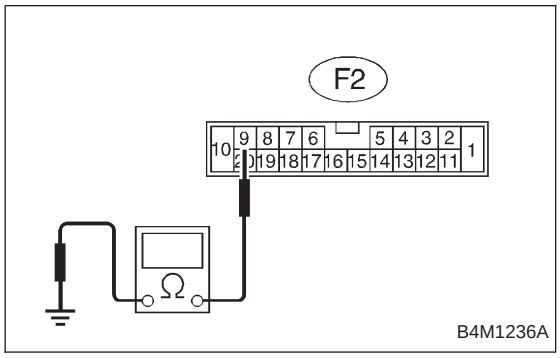


7B10	CHECK WIRING HARNESS.

Measure resistance between connector (F2) and chassis ground.

Connector & terminal
(F2) No. 9 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **7B11**.
NO : Repair harness.



7B11	CHECK WIRING HARNESS.

1) Connect connector to ABSCM&H/U.
2) Measure resistance between connector (F2) and chassis ground.

Connector & terminal
(F2) No. 9 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **7B12**.
NO : Repair harness.

7B12	CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR.

CHECK ***: Is there poor contact in ABSCM&H/U connector? <Ref. to FOREWORD [T3C1].>***
YES : Repair connector.
NO : Replace ABSCM&H/U.

C: TROUBLE CODE DOES NOT APPEAR.

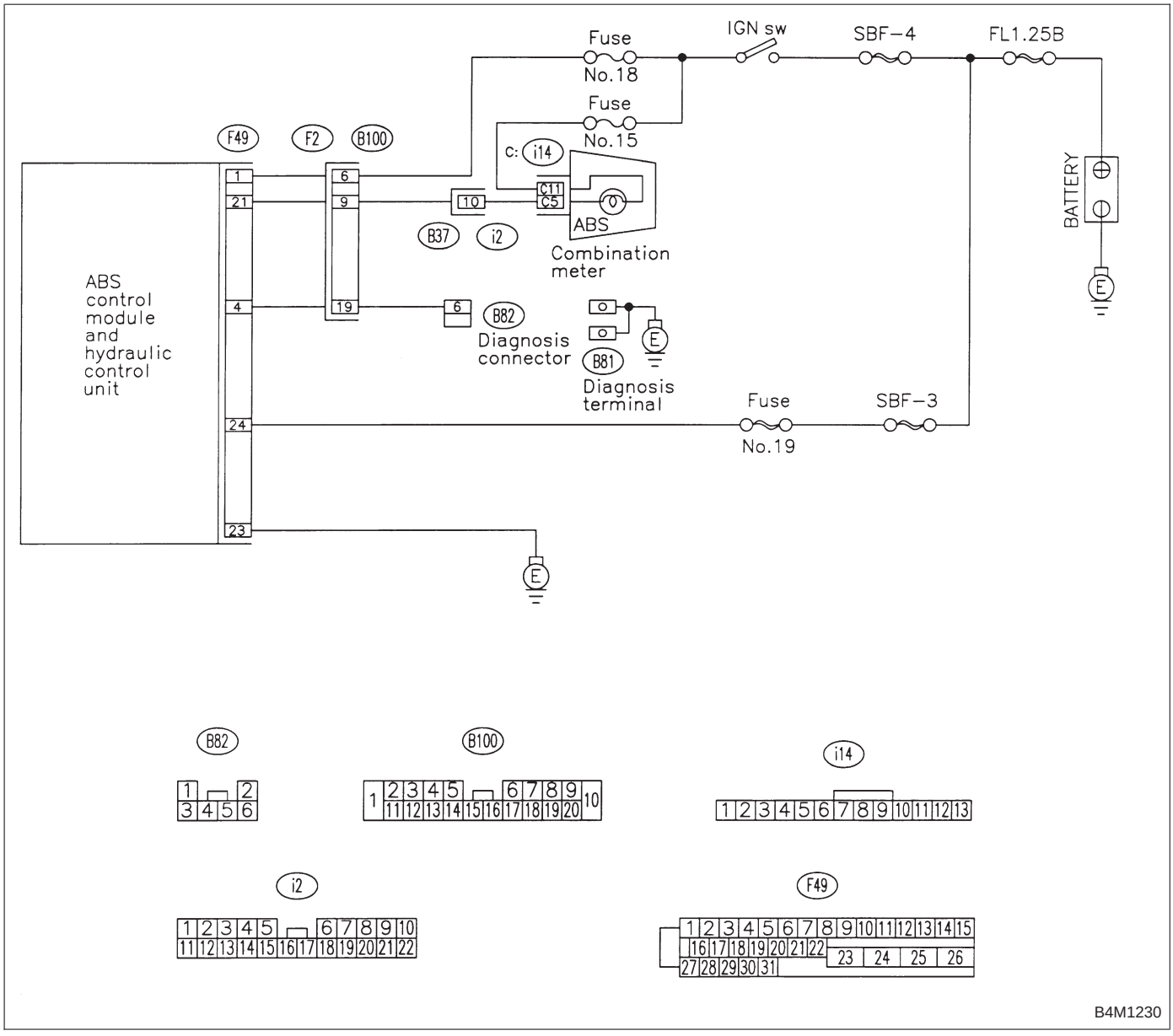
DIAGNOSIS:

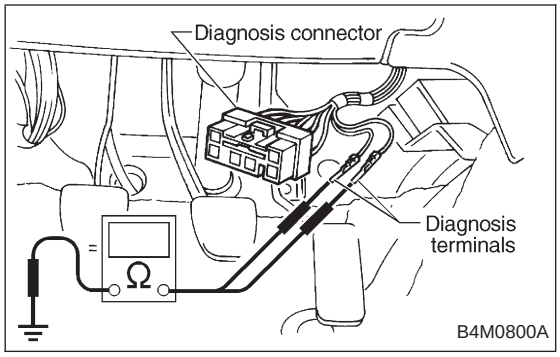
- Diagnosis circuit is open.

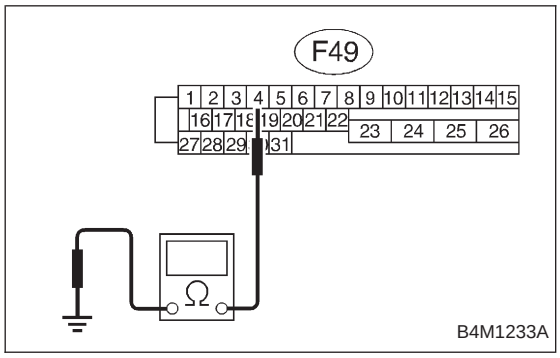
TROUBLE SYMPTOM:

- The ABS warning light turns on or off normally but the start code cannot be read out in the diagnostic mode.

WIRING DIAGRAM:







7C1	CHECK DIAGNOSIS TERMINAL.

Measure resistance between diagnosis terminals (B81) and chassis ground.

Terminals
Diagnosis terminal (A) — Chassis ground:
Diagnosis terminal (B) — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **7C2**.
NO : Repair diagnosis terminal harness.

7C2	CHECK DIAGNOSIS LINE.

1) Turn ignition switch to OFF.
2) Connect diagnosis terminal to diagnosis connector (B82) No. 6.
3) Disconnect connector from ABSCM&H/U.
4) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 4 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **7C3**.
NO : Repair harness connector between ABSCM&H/U and diagnosis connector.

7C3	CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR.

CHECK ***: Is there poor contact in ABSCM&H/U connector? <Ref. to FOREWORD [T3C1].>***
YES : Repair connector.
NO : Replace ABSCM&H/U.

8. Diagnostics Chart with Trouble Code by ABS Warning Light

A: LIST OF TROUBLE CODE

Trouble code	Contents of diagnosis		Ref. to
11	Start code ● Trouble code is shown after start code. ● Only start code is shown in normal condition.		—
21	Abnormal ABS sensor (Open circuit or input voltage too high)	Front right ABS sensor	4-4d [T8B0]
23		Front left ABS sensor	4-4d [T8C0]
25		Rear right ABS sensor	4-4d [T8D0]
27		Rear left ABS sensor	4-4d [T8E0]
22	Abnormal ABS sensor (Abnormal ABS sensor signal)	Front right ABS sensor	4-4d [T8F0]
24		Front left ABS sensor	4-4d [T8G0]
26		Rear right ABS sensor	4-4d [T8H0]
28		Rear left ABS sensor	4-4d [T8I0]
29		Any one of four	4-4d [T8J0]
31	Abnormal solenoid valve circuit(s) in ABS control module and hydraulic unit	Front right inlet valve	4-4d [T8K0]
32		Front right outlet valve	4-4d [T8O0]
33		Front left inlet valve	4-4d [T8L0]
34		Front left outlet valve	4-4d [T8P0]
35		Rear right inlet valve	4-4d [T8M0]
36		Rear right outlet valve	4-4d [T8Q0]
37		Rear left inlet valve	4-4d [T8N0]
38		Rear left outlet valve	4-4d [T8R0]
41	Abnormal ABS control module		4-4d [T8S0]
42	Source voltage is abnormal.		4-4d [T8T0]
44	A combination of AT control abnormal		4-4d [T8U0]
51	Abnormal valve relay		4-4d [T8V0]
52	Abnormal motor and/or motor relay		4-4d [T8W0]
54	Abnormal stop light switch		4-4d [T8X0]
56	Abnormal G sensor output voltage		4-4d [T8Y0]

B: TROUBLE CODE 21 (FRONT RH)
C: TROUBLE CODE 23 (FRONT LH)
D: TROUBLE CODE 25 (REAR RH)
E: TROUBLE CODE 27 (REAR LH)
— ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —

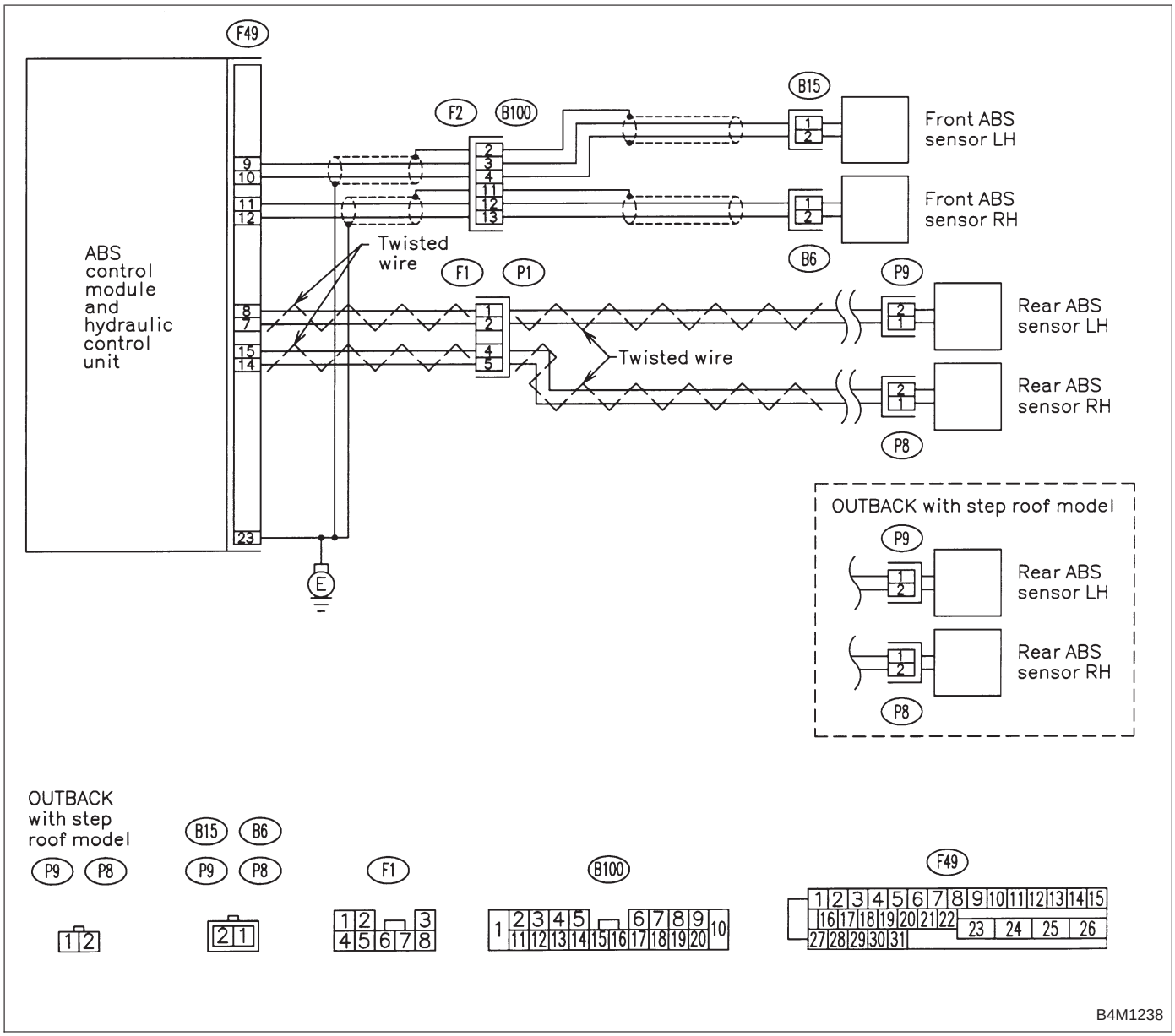
DIAGNOSIS:

- Faulty ABS sensor (Broken wire, input voltage too high)
- Faulty harness connector

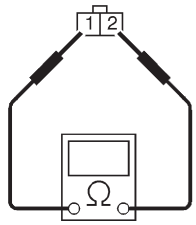
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:

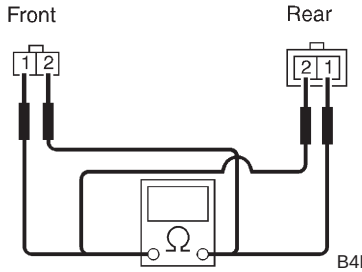


Except OUTBACK model



B4M0806E

OUTBACK model



B4M1036C

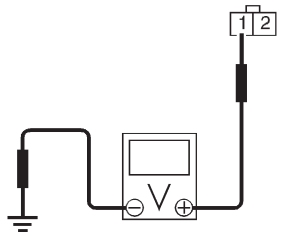
8E1	CHECK ABS SENSOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABS sensor.
3) Measure resistance of ABS sensor connector terminals.

Terminal
Front RH No. 1 — No. 2:
Front LH No. 1 — No. 2:
Rear RH No. 1 — No. 2:
Rear LH No. 1 — No. 2:

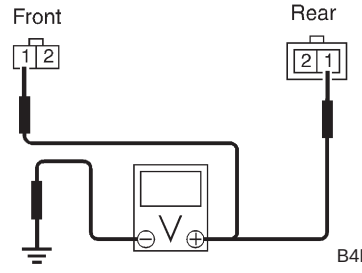
CHECK ***: Is the resistance between 0.8 and 1.2 kΩ?***
YES : Go to step **8E2**.
NO : Replace ABS sensor.

Except OUTBACK model



B4M0807E

OUTBACK model



B4M1037C

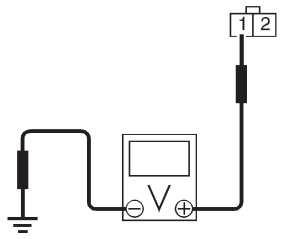
8E2	CHECK BATTERY SHORT OF ABS SENSOR.

1) Disconnect connector from ABSCM&H/U.
2) Measure voltage between ABS sensor and chassis ground.

Terminal
Front RH No. 1 (+) — Chassis ground (−):
Front LH No. 1 (+) — Chassis ground (−):
Rear RH No. 1 (+) — Chassis ground (−):
Rear LH No. 1 (+) — Chassis ground (−):

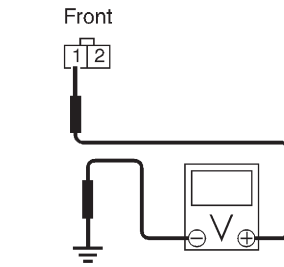
CHECK ***: Is the voltage less than 1 V?***
YES : Go to step **8E3**.
NO : Replace ABS sensor.

Except OUTBACK model

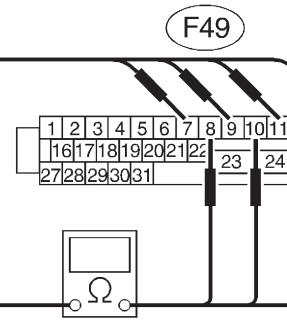


B4M0807E

OUTBACK model



B4M1037C



B4M1239A

8E3	CHECK BATTERY SHORT OF ABS SENSOR.

1) Turn ignition switch to ON.
2) Measure voltage between ABS sensor and chassis ground.

Terminal
Front RH No. 1 (+) — Chassis ground (−):
Front LH No. 1 (+) — Chassis ground (−):
Rear RH No. 1 (+) — Chassis ground (−):
Rear LH No. 1 (+) — Chassis ground (−):

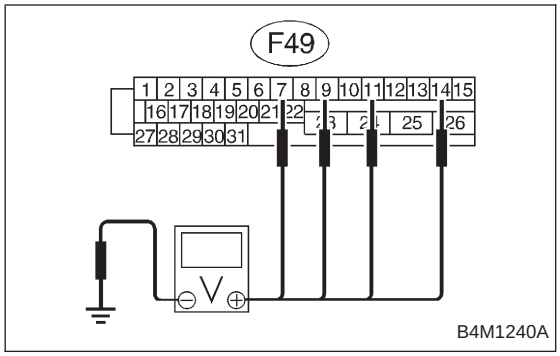
CHECK ***: Is the voltage less than 1 V?***
YES : Go to step **8E4**.
NO : Replace ABS sensor.

8E4	CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR.

1) Turn ignition switch to OFF.
2) Connect connector to ABS sensor.
3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
Trouble code 21 / (F49) No. 11 — No. 12:
Trouble code 23 / (F49) No. 9 — No. 10:
Trouble code 25 / (F49) No. 14 — No. 15:
Trouble code 27 / (F49) No. 7 — No. 8:

CHECK ***: Is the resistance between 0.8 and 1.2 kΩ?***
YES : Go to step **8E5**.
NO : Repair harness/connector between ABSCM&H/U and ABS sensor.



8E5	CHECK BATTERY SHORT OF HARNESS.

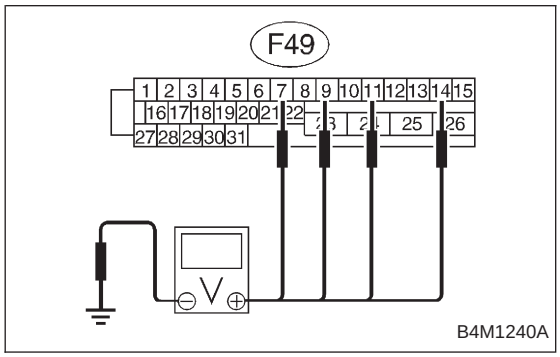
Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
Trouble code 21 / (F49) No. 11 (+) — Chassis ground (−):
Trouble code 23 / (F49) No. 9 (+) — Chassis ground (−):
Trouble code 25 / (F49) No. 14 (+) — Chassis ground (−):
Trouble code 27 / (F49) No. 7 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **8E6**.

NO : Repair harness between ABSCM&H/U and ABS sensor.



8E6	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
Trouble code 21 / (F49) No. 11 (+) — Chassis ground (−):
Trouble code 23 / (F49) No. 9 (+) — Chassis ground (−):
Trouble code 25 / (F49) No. 14 (+) — Chassis ground (−):
Trouble code 27 / (F49) No. 7 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **8E7**.

NO : Repair harness between ABSCM&H/U and ABS sensor.

8E7	CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

CHECK ***: Are the ABS sensor installation bolts tightened securely?***

YES : Go to step **8E8**.

NO : Tighten ABS sensor installation bolts securely.

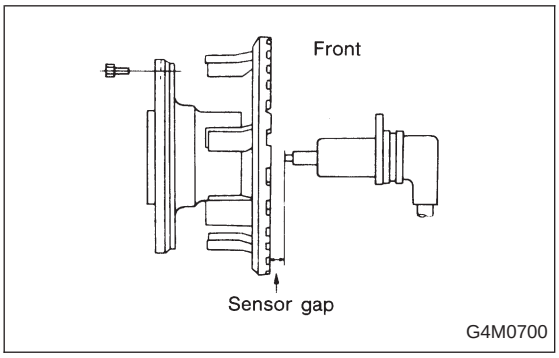
8E8	CHECK INSTALLATION OF TONE WHEEL.

Tightening torque:
13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)

CHECK ***: Are the tone wheel installation bolts tightened securely?***

YES : Go to step **8E9**.

NO : Tighten tone wheel installation bolts securely.

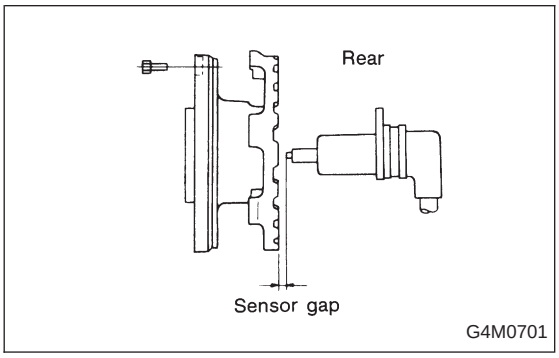


8E9	CHECK ABS SENSOR GAP.

Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.

CHECK ***: Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)



YES : Go to step **8E10**.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

8E10	CHECK HUB RUNOUT.

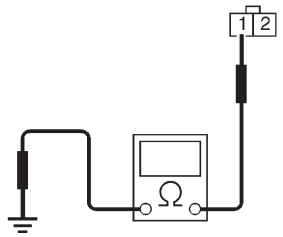
Measure hub runout.

CHECK ***: Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **8E11**.

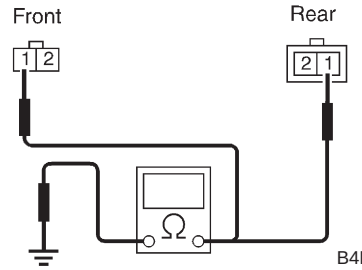
NO : Repair hub.

Except OUTBACK model

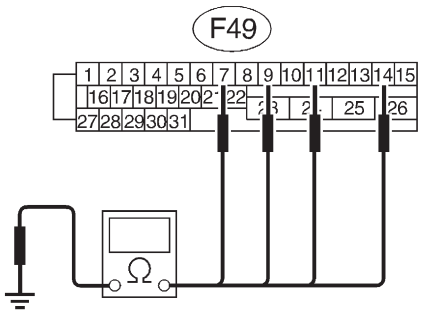


B4M0818E

OUTBACK model



B4M1042C



B4M1241A

8E11	CHECK GROUND SHORT OF ABS SENSOR.

1) Turn ignition switch to ON.
2) Measure resistance between ABS sensor and chassis ground.

Terminal
Front RH No. 1 — Chassis ground:
Front LH No. 1 — Chassis ground:
Rear RH No. 1 — Chassis ground:
Rear LH No. 1 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **8E12**.
NO : Replace ABS sensor and ABSCM&H/U.

8E12	CHECK GROUND SHORT OF HARNESS.

1) Turn ignition switch to OFF.
2) Connect connector to ABS sensor.
3) Measure resistance between ABSCM&H/U connector terminal and chassis ground.

Connector & terminal
Trouble code 21 / (F49) No. 11 — Chassis ground:
Trouble code 23 / (F49) No. 9 — Chassis ground:
Trouble code 25 / (F49) No. 14 — Chassis ground:
Trouble code 27 / (F49) No. 7 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **8E13**.
NO : Repair harness between ABSCM&H/U and ABS sensor.
Replace ABSCM&H/U.

8E13	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to FOREWORD [T3C1].>***
YES : Repair connector.
NO : Go to step **8E14**.

8E14	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8E15**.

8E15	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

NOTE:
Check harness and connectors between ABSCM&H/U and ABS sensor.

F: TROUBLE CODE 22 (FRONT RH)
G: TROUBLE CODE 24 (FRONT LH)
H: TROUBLE CODE 26 (REAR RH)
I: TROUBLE CODE 28 (REAR LH)
— ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —

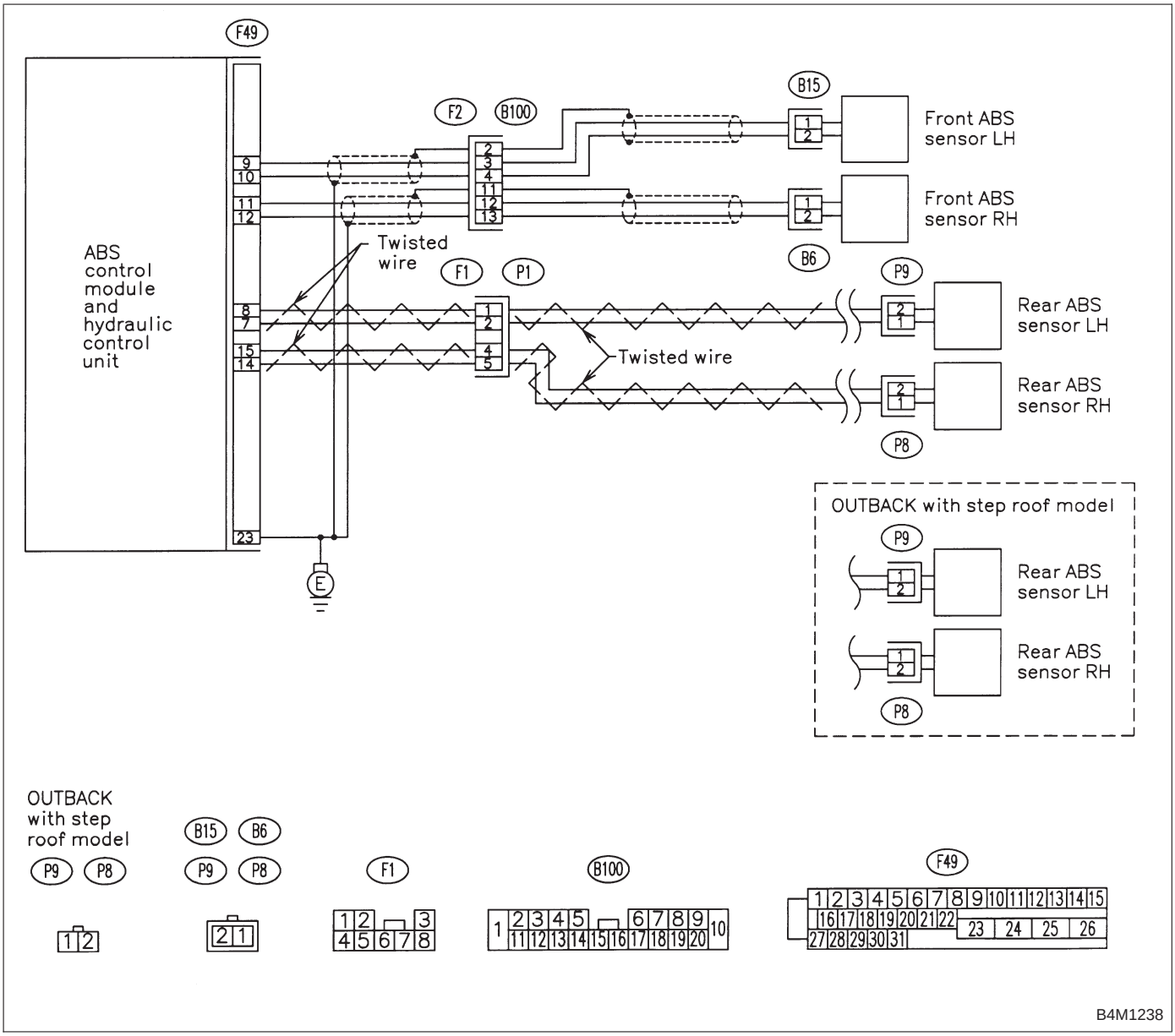
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



8I1	CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

CHECK ***: Are the ABS sensor installation bolts tightened securely?***

YES : Go to step **8I2**.

NO : Tighten ABS sensor installation bolts securely.

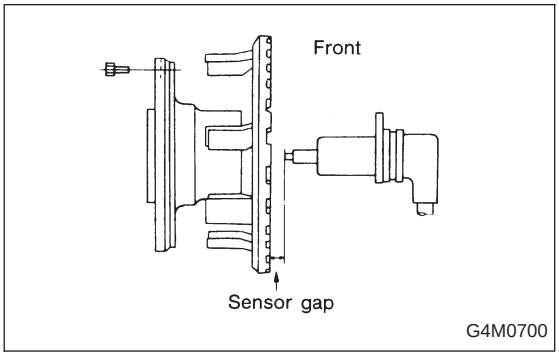
8I2	CHECK INSTALLATION OF TONE WHEEL.

Tightening torque:
13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)

CHECK ***: Are the tone wheel installation bolts tightened securely?***

YES : Go to step **8I3**.

NO : Tighten tone wheel installation bolts securely.

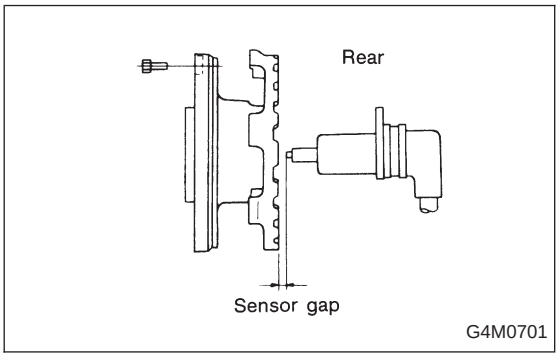


8I3	CHECK ABS SENSOR GAP.

Measure tone wheel to pole piece gap over entire perimeter of the wheel.

CHECK ***: Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)



YES : Go to step **8I4**.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

8I4	CHECK OSCILLOSCOPE.

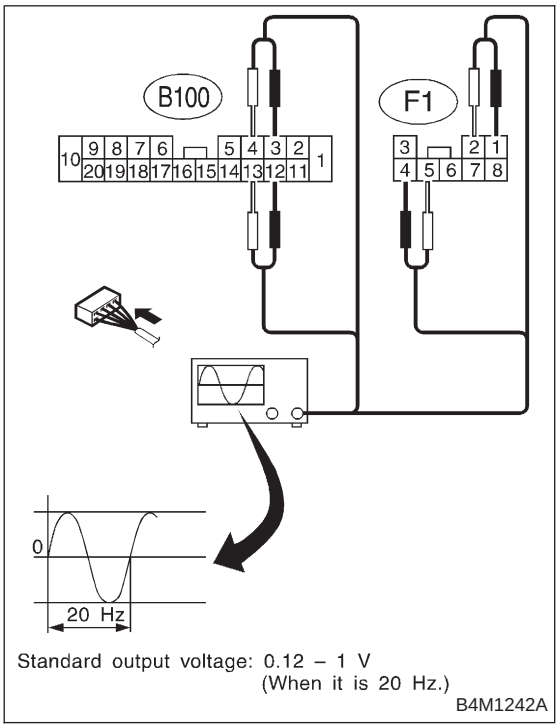
CHECK ***: Is an oscilloscope available?***

YES : Go to step **8I5**.

NO : Go to step **8I6**.

8I5	CHECK ABS SENSOR SIGNAL.

1) Raise all four wheels of ground.
2) Turn ignition switch OFF.
3) Connect the oscilloscope to the connector (F1) or connector (B100).
4) Turn ignition switch ON.



Standard output voltage: 0.12 – 1 V
(When it is 20 Hz.)
B4M1242A

5) Rotate wheels and measure voltage at specified frequency.

NOTE:
When this inspection is completed, the ABS control module sometimes stores the trouble code 29.

Connector & terminal
Trouble code 22 / (B100) No. 12 (+) — No. 13 (−):
Trouble code 24 / (B100) No. 3 (+) — No. 4 (−):
Trouble code 26 / (F1) No. 4 (+) — No. 5 (−):
Trouble code 28 / (F1) No. 1 (+) — No. 2 (−):
Specified voltage: 0.12 — 1 V (When it is 20 Hz.)

CHECK ***: Is oscilloscope pattern smooth, as shown in figure?***

YES : Go to step **8I9**.
NO : Go to step **8I6**.

8I6	CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.

Remove disc rotor or drum from hub in accordance with trouble code.

CHECK ***: Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?***

YES : Thoroughly remove dirt or other foreign matter.
NO : Go to step **8I7**.

8I7	CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.

CHECK ***: Are there broken or damaged in the ABS sensor pole piece or the tone wheel?***

YES : Replace ABS sensor or tone wheel.
NO : Go to step **8I8**.

8I8	CHECK HUB RUNOUT.

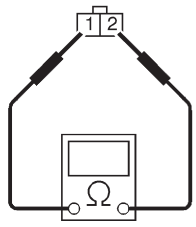
Measure hub runout.

CHECK ***: Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **8I9**.

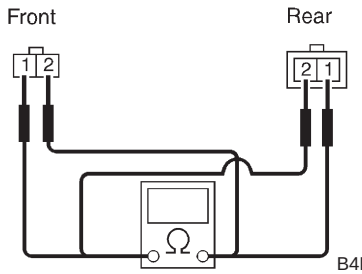
NO : Repair hub.

Except OUTBACK model



B4M0806E

OUTBACK model



B4M1036C

8I9	CHECK RESISTANCE OF ABS SENSOR.

1) Turn ignition switch OFF.
2) Disconnect connector from ABS sensor.
3) Measure resistance between ABS sensor connector terminals.

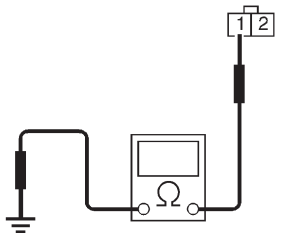
Terminal
Front RH No. 1 — No. 2:
Front LH No. 1 — No. 2:
Rear RH No. 1 — No. 2:
Rear LH No. 1 — No. 2:

CHECK ***: Is the resistance between 0.8 and 1.2 kΩ?***

YES : Go to step **8I10**.

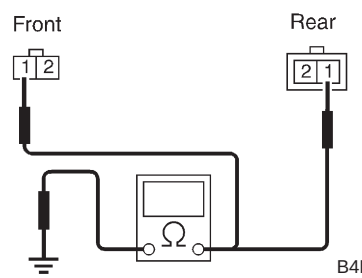
NO : Replace ABS sensor.

Except OUTBACK model



B4M0818E

OUTBACK model



B4M1042C

8I10	CHECK GROUND SHORT OF ABS SENSOR.

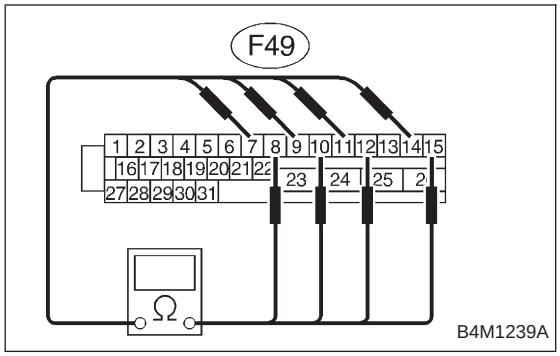
Measure resistance between ABS sensor and chassis ground.

Terminal
Front RH No. 1 — Chassis ground:
Front LH No. 1 — Chassis ground:
Rear RH No. 1 — Chassis ground:
Rear LH No. 1 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **8I11**.

NO : Replace ABS sensor.

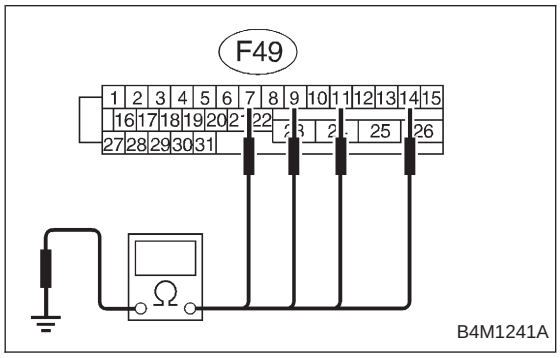


8I11	CHECK HARNESS/CONNECTOR BETWEEN ABSCM AND ABS SENSOR.

1) Connect connector to ABS sensor.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance at ABSCM&H/U connector terminals.

Connector & terminal
Trouble code 22 / (F49) No. 11 — No. 12:
Trouble code 24 / (F49) No. 9 — No. 10:
Trouble code 26 / (F49) No. 14 — No. 15:
Trouble code 28 / (F49) No. 7 — No. 8:

CHECK ***: Is the resistance between 0.8 and 1.2 kΩ?***
YES : Go to step **8I12**.
NO : Repair harness/connector between ABSCM&H/U and ABS sensor.

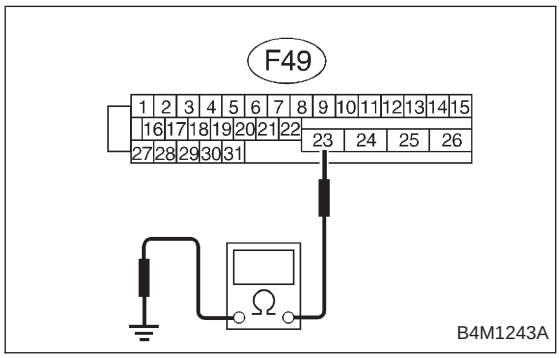


8I12	CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
Trouble code 22 / (F49) No. 11 — Chassis ground:
Trouble code 24 / (F49) No. 9 — Chassis ground:
Trouble code 26 / (F49) No. 14 — Chassis ground:
Trouble code 28 / (F49) No. 7 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **8I13**.
NO : Repair harness/connector between ABSCM&H/U and ABS sensor.



8I13	CHECK GROUND CIRCUIT OF ABSCM&H/U.

Measure resistance between ABSCM&H/U and chassis ground.

Connector & terminal
(F49) No. 23 — GND:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **8I14**.
NO : Repair ABSCM&H/U ground harness.

8I14	CHECK POOR CONTACT IN CONNECTORS.

CHECK : ***Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **8I15**.

8I15	CHECK SOURCES OF SIGNAL NOISE.

CHECK : ***Is the car telephone or the wireless transmitter properly installed?***

YES : Go to step **8I16**.

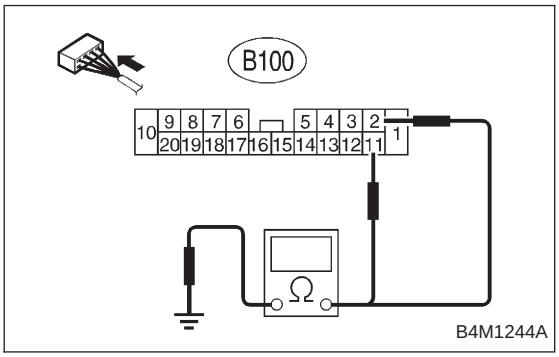
NO : Properly install the car telephone or the wireless transmitter.

8I16	CHECK SOURCES OF SIGNAL NOISE.

CHECK : ***Are noise sources (such as an antenna) installed near the sensor harness?***

YES : Install the noise sources apart from the sensor harness.

NO : Go to step **8I17**.



8I17	CHECK SHIELD CIRCUIT.

1) Connect all connectors.
2) Measure resistance between shield connector and chassis ground.

Connector & terminal
Trouble code 22 / (B100) No. 11 — Chassis ground:
Trouble code 24 / (B100) No. 2 — Chassis ground:
Trouble code 26 / Go to step 8I18.
Trouble code 28 / Go to step 8I18.

CHECK : ***Is the resistance less than 0.5 Ω?***

YES : Go to step **8I18**.

NO : Repair shield harness.

8I18	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8I19**.

8I19	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary noise interference.

J: TROUBLE CODE 29 — ABNORMAL ABS SENSOR SIGNAL (ANY ONE OF FOUR) —

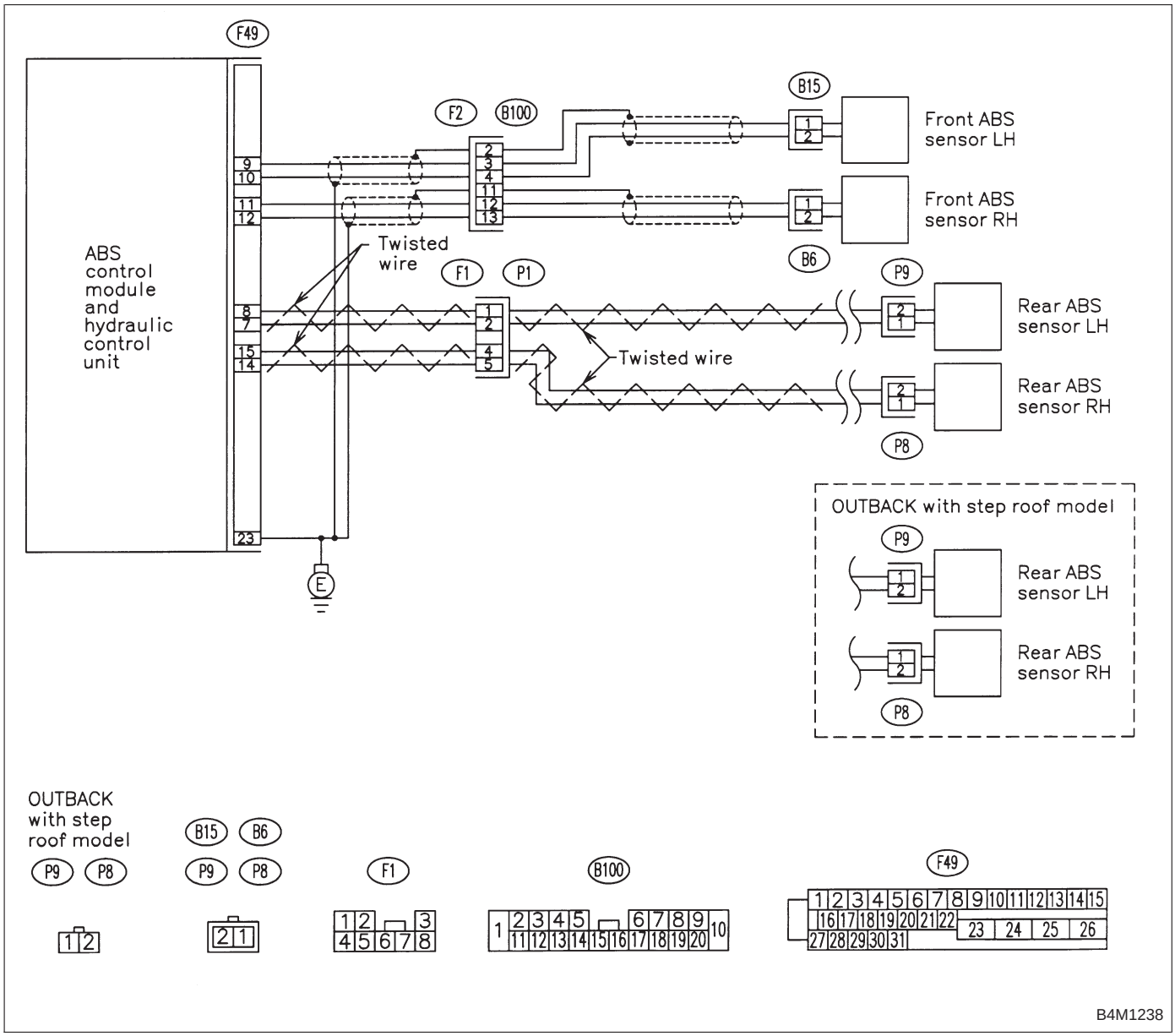
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty tone wheel
- Wheels turning freely for a long time

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



8J1	CHECK IF THE WHEELS HAVE TURNED FREELY FOR A LONG TIME.

CHECK : ***Check if the wheels have been turned freely for more than one minute, such as when the vehicle is jacked-up, under full-lock cornering or when tire is not in contact with road surface.***

YES : The ABS is normal. Erase the trouble code.

NOTE:
When the wheels turn freely for a long time, such as when the vehicle is towed or jacked-up, or when steering wheel is continuously turned all the way, this trouble code may sometimes occur.

NO : Go to step **8J2**.

8J2	CHECK TIRE SPECIFICATIONS.

CHECK : ***Are the tire specifications correct?***

YES : Go to step **8J3**.

NO : Replace tire.

8J3	CHECK WEAR OF TIRE.

CHECK : ***Is the tire worn excessively?***

YES : Replace tire.

NO : Go to step **8J4**.

8J4	CHECK TIRE PRESSURE.

CHECK : ***Is the tire pressure correct?***

YES : Go to step **8J5**.

NO : Adjust tire pressure.

8J5	CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

CHECK : ***Are the ABS sensor installation bolts tightened securely?***

YES : Go to step **8J6**.

NO : Tighten ABS sensor installation bolts securely.

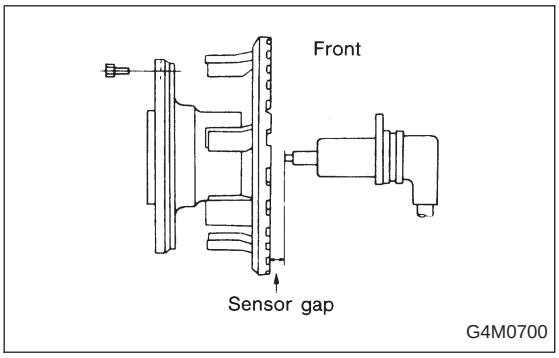
8J6	CHECK INSTALLATION OF TONE WHEEL.

Tightening torque:
13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)

CHECK ***: Are the tone wheel installation bolts tightened securely?***

YES : Go to step **8J7**.

NO : Tighten tone wheel installation bolts securely.

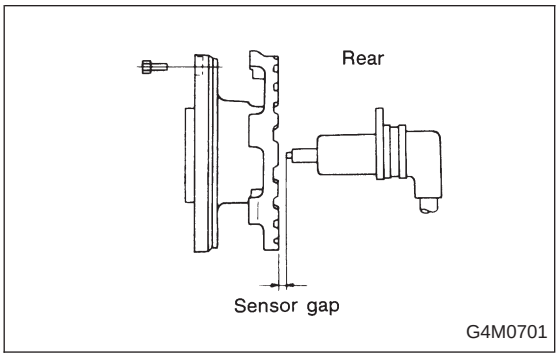


8J7	CHECK ABS SENSOR GAP.

Measure tone wheel to pole piece gap over entire perimeter of the wheel.

CHECK ***: Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)



YES : Go to step **8J8**.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

8J8	CHECK OSCILLOSCOPE.

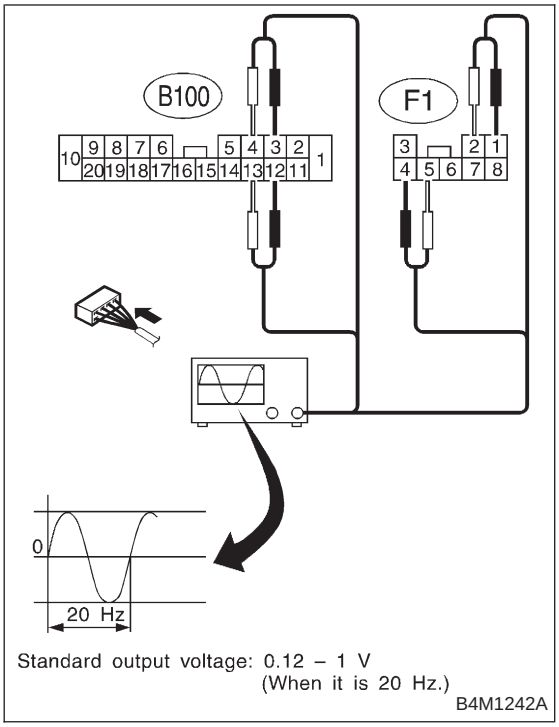
CHECK ***: Is an oscilloscope available?***

YES : Go to step **8J9**.

NO : Go to step **8J10**.

8J9	CHECK ABS SENSOR SIGNAL.

1) Raise all four wheels of ground.
2) Turn ignition switch OFF.
3) Connect the oscilloscope to the connector (F1) or connector (B100).
4) Turn ignition switch ON.



Standard output voltage: 0.12 – 1 V
(When it is 20 Hz.)
B4M1242A

5) Rotate wheels and measure voltage at specified frequency.

NOTE:
When this inspection is completed, the ABS control module sometimes stores the trouble code 29.

Connector & terminal
(B100) No. 12 (+) — No. 13 (−) (Front RH):
(B100) No. 3 (+) — No. 4 (−) (Front LH):
(F1) No. 4 (+) — No. 5 (−) (Rear RH):
(F1) No. 1 (+) — No. 2 (−) (Rear LH):
Specified voltage: 0.12 — 1 V (When it is 20 Hz.)

CHECK ***: Is oscilloscope pattern smooth, as shown in figure?***

YES : Go to step **8J13**.
NO : Go to step **8J10**.

8J10	CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.

Remove disc rotor from hub.

CHECK ***: Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?***

YES : Thoroughly remove dirt or other foreign matter.
NO : Go to step **8J11**.

8J11	CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.

CHECK ***: Are there broken or damaged teeth in the ABS sensor pole piece or the tone wheel?***

YES : Replace ABS sensor or tone wheel.
NO : Go to step **8J12**.

8J12	CHECK HUB RUNOUT.

Measure hub runout.

CHECK ***: Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **8J13**.
NO : Repair hub.

8J13	CHECK ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8J14**.

8J14	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

K: TROUBLE CODE 31 (FRONT RH)
L: TROUBLE CODE 33 (FRONT LH)
M: TROUBLE CODE 35 (REAR RH)
N: TROUBLE CODE 37 (REAR LH)
— ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U —

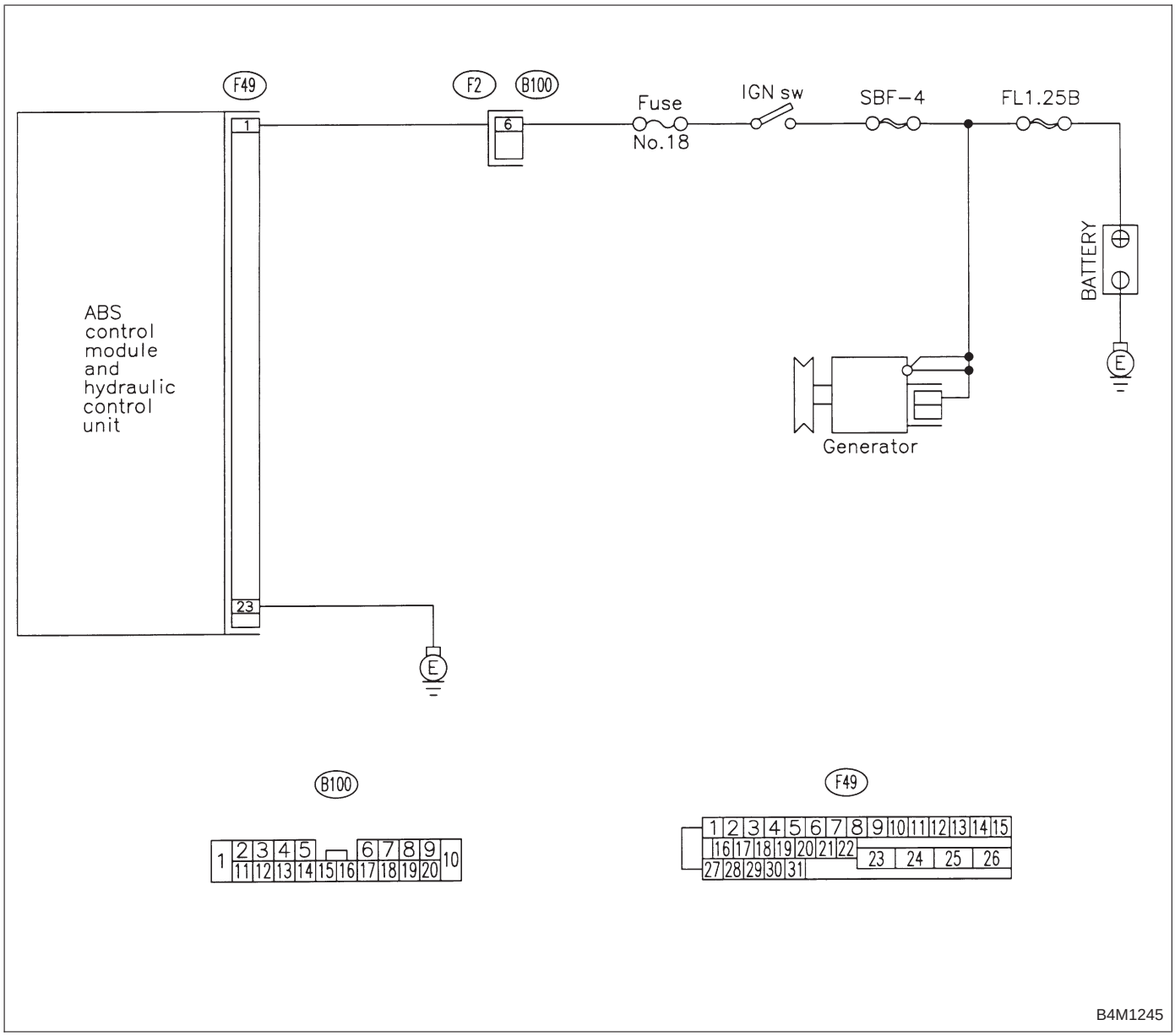
DIAGNOSIS:

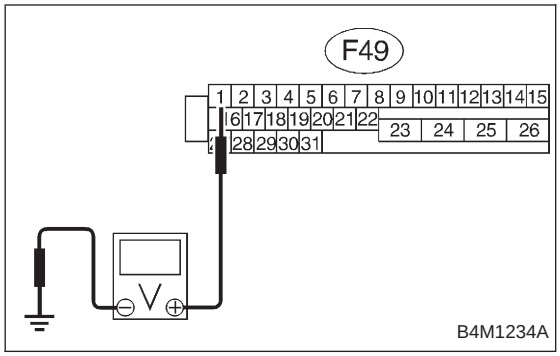
- Faulty harness/connector
- Faulty inlet solenoid valve in ABSCM&H/U

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





8N1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

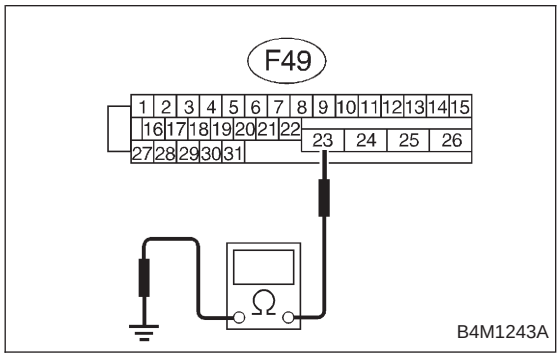
1) Disconnect connector from ABSCM&H/U.
2) Run the engine at idle.
3) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **8N2**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



8N2	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **8N3**.

NO : Repair ABSCM&H/U ground harness.

8N3	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **8N4**.

8N4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8N5**.

8N5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

O: TROUBLE CODE 32 (FRONT RH)
P: TROUBLE CODE 34 (FRONT LH)
Q: TROUBLE CODE 36 (REAR RH)
R: TROUBLE CODE 38 (REAR LH)
— ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U —

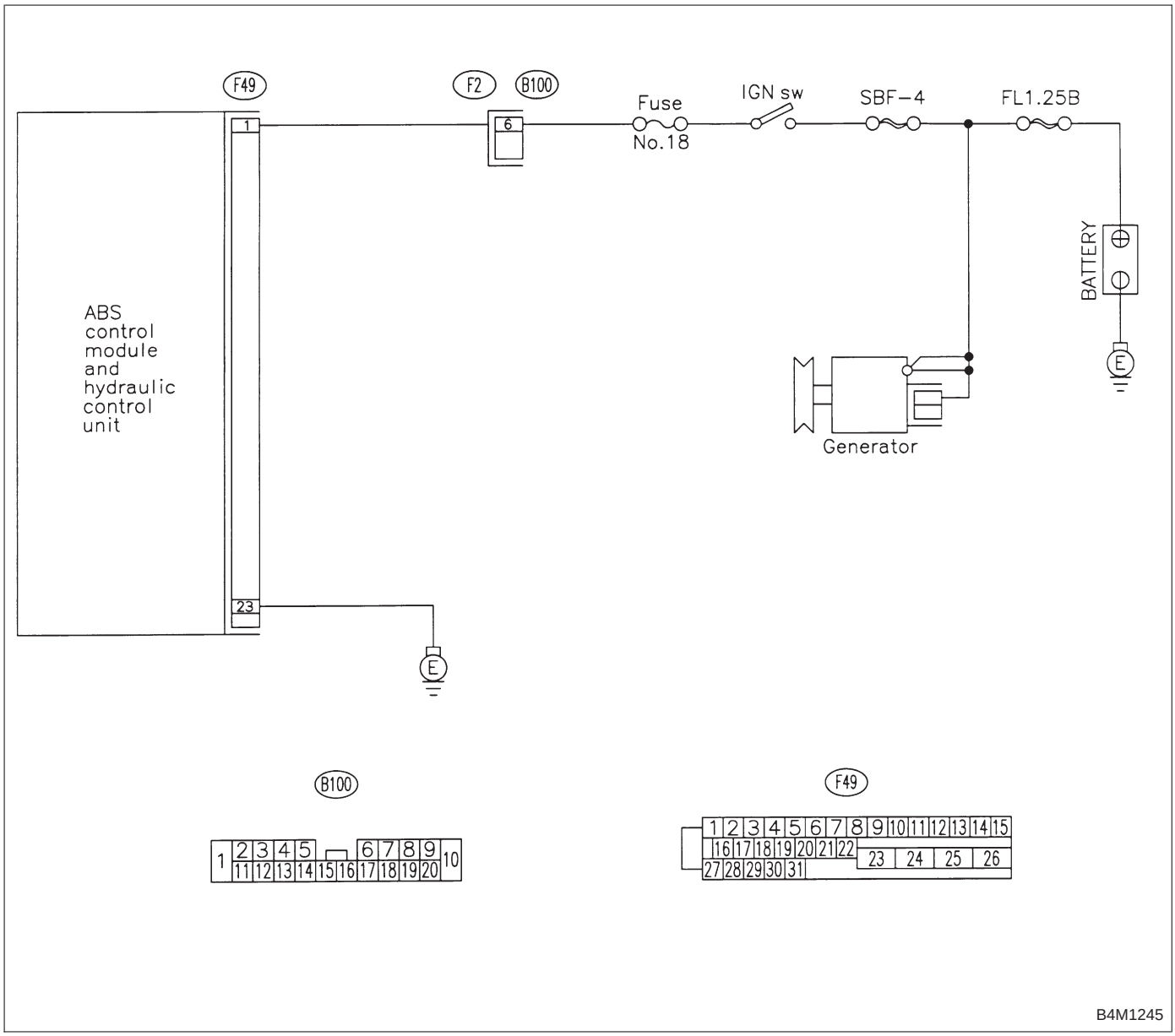
DIAGNOSIS:

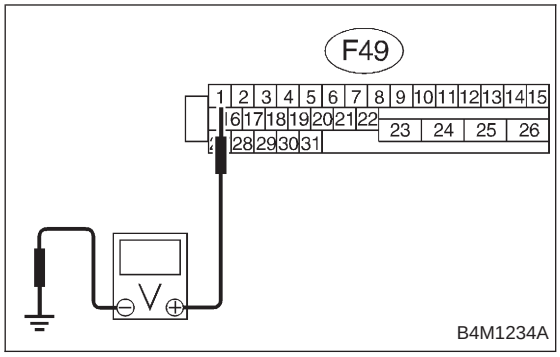
- Faulty harness/connector
- Faulty outlet solenoid valve in ABSCM&H/U

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





8R1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

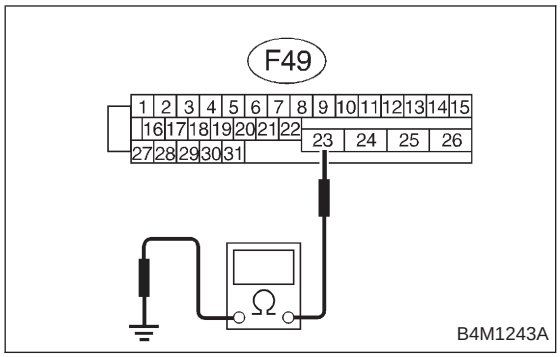
1) Disconnect connector from ABSCM&H/U.
2) Run the engine at idle.
3) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **8R2**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



8R2	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **8R3**.

NO : Repair ABSCM&H/U ground harness.

8R3	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **8R4**.

8R4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8R5**.

8R5	**CHECK ANY OTHER TROUBLE CODES APPEARANCE.**

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

S: TROUBLE CODE 41
— ABNORMAL ABS CONTROL MODULE —

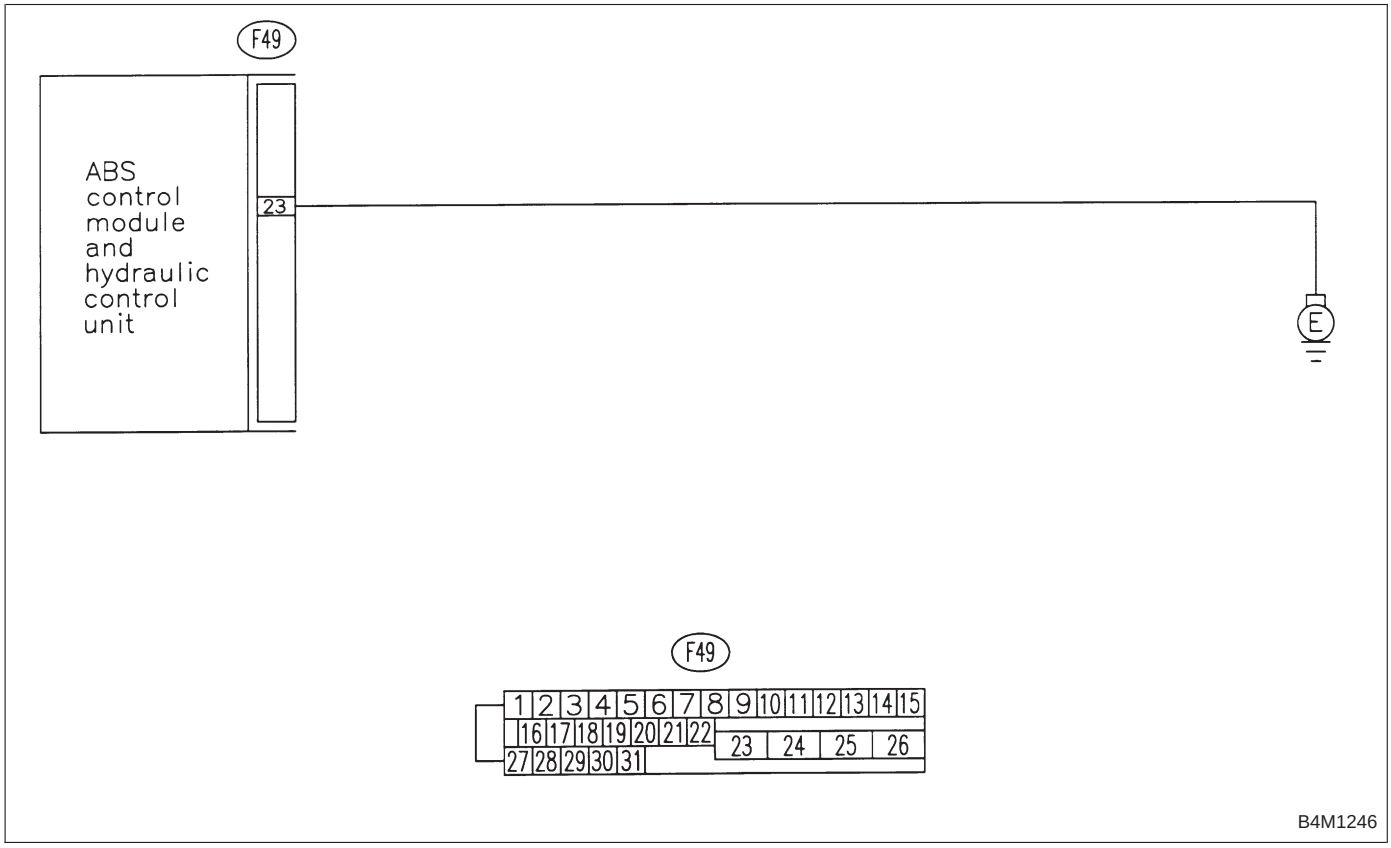
DIAGNOSIS:

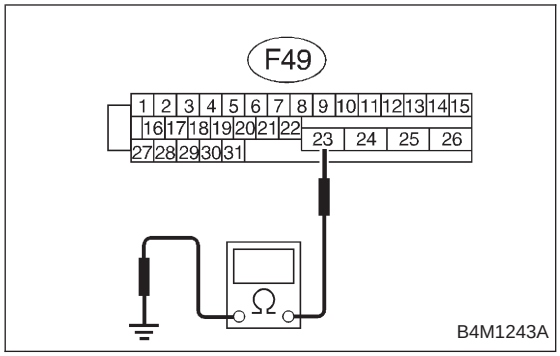
- Faulty ABSCM&H/U.

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





8S1	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance between ABSCM&H/U and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **8S2**.
NO : Repair ABSCM&H/U ground harness.

8S2	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between battery, ignition switch and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***
YES : Repair connector.
NO : Go to step **8S3**.

8S3	CHECK SOURCES OF SIGNAL NOISE.

CHECK ***: Is the car telephone or the wireless transmitter properly installed?***
YES : Go to step **8S4**.
NO : Properly install the car telephone or the wireless transmitter.

8S4	CHECK SOURCES OF SIGNAL NOISE.

CHECK ***: Are noise sources (such as an antenna) installed near the sensor harness?***
YES : Install the noise sources apart from the sensor harness.
NO : Go to step **8S5**.

8S5	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***
YES : Replace ABSCM&H/U.
NO : Go to step **8S6**.

8S6	**CHECK ANY OTHER TROUBLE CODES APPEARANCE.**

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

T: TROUBLE CODE 42 — SOURCE VOLTAGE IS ABNORMAL. —

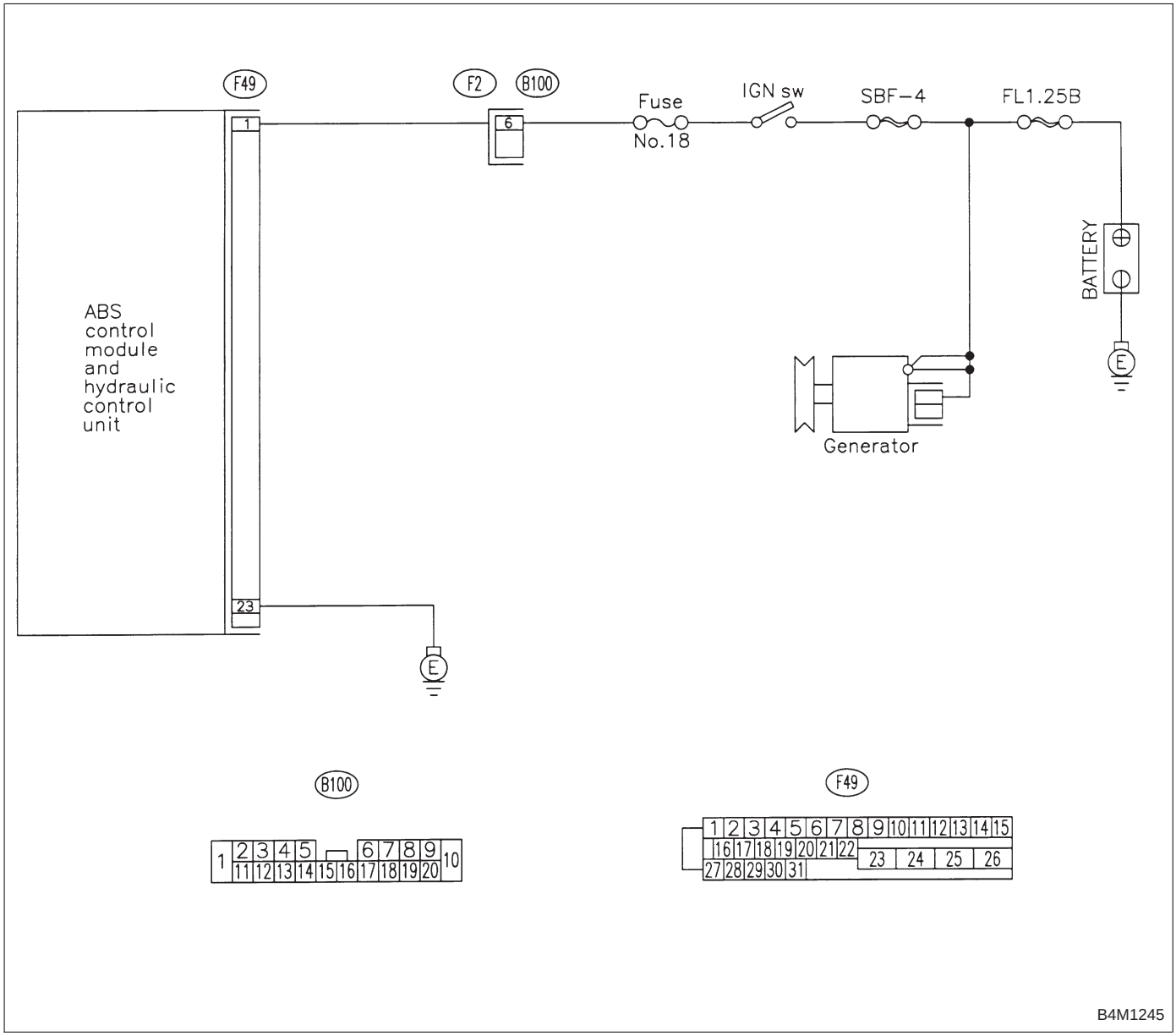
DIAGNOSIS:

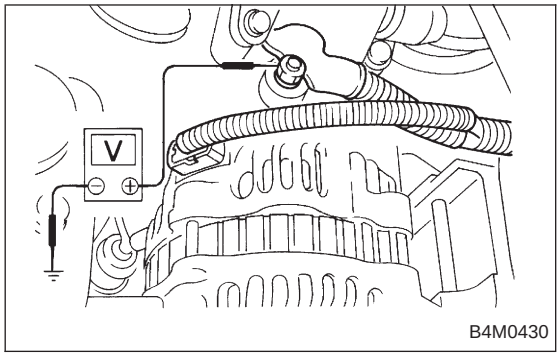
- Power source voltage of the ABSCM&H/U is low or high.

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





8T1	CHECK GENERATOR.

1) Start engine.
2) Idling after warm-up.
3) Measure voltage between generator B terminal and chassis ground.

Terminal
Generator B terminal — Chassis ground:

CHECK ***: Is the voltage between 10 V and 17 V?***

YES : Go to step **8T2**.

NO : Repair generator.

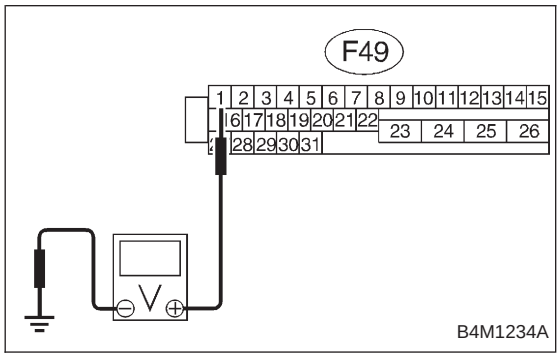
8T2	CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

CHECK ***: Are the positive and negative battery terminals tightly clamped?***

YES : Go to step **8T3**.

NO : Tighten the clamp of terminal.



8T3	CHECK INPUT VOLTAGE OF ABSCM&H/U.

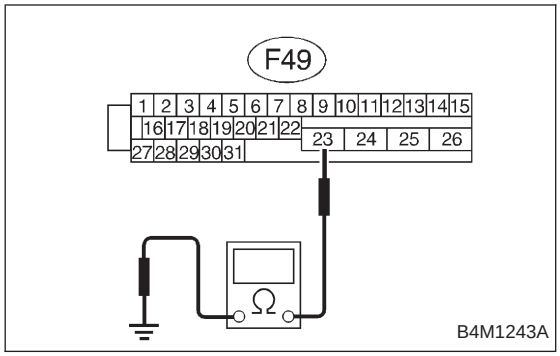
1) Disconnect connector from ABSCM&H/U.
2) Run the engine at idle.
3) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 17 V?***

YES : Go to step **8T4**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



8T4	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **8T5**.
NO : Repair ABSCM&H/U ground harness.

8T5	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***
YES : Repair connector.
NO : Go to step **8T6**.

8T6	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***
YES : Replace ABSCM&H/U.
NO : Go to step **8T7**.

8T7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***
YES : Proceed with the diagnosis corresponding to the trouble code.
NO : A temporary poor contact.

U: TROUBLE CODE 44 — A COMBINATION OF AT CONTROL ABNORMAL —

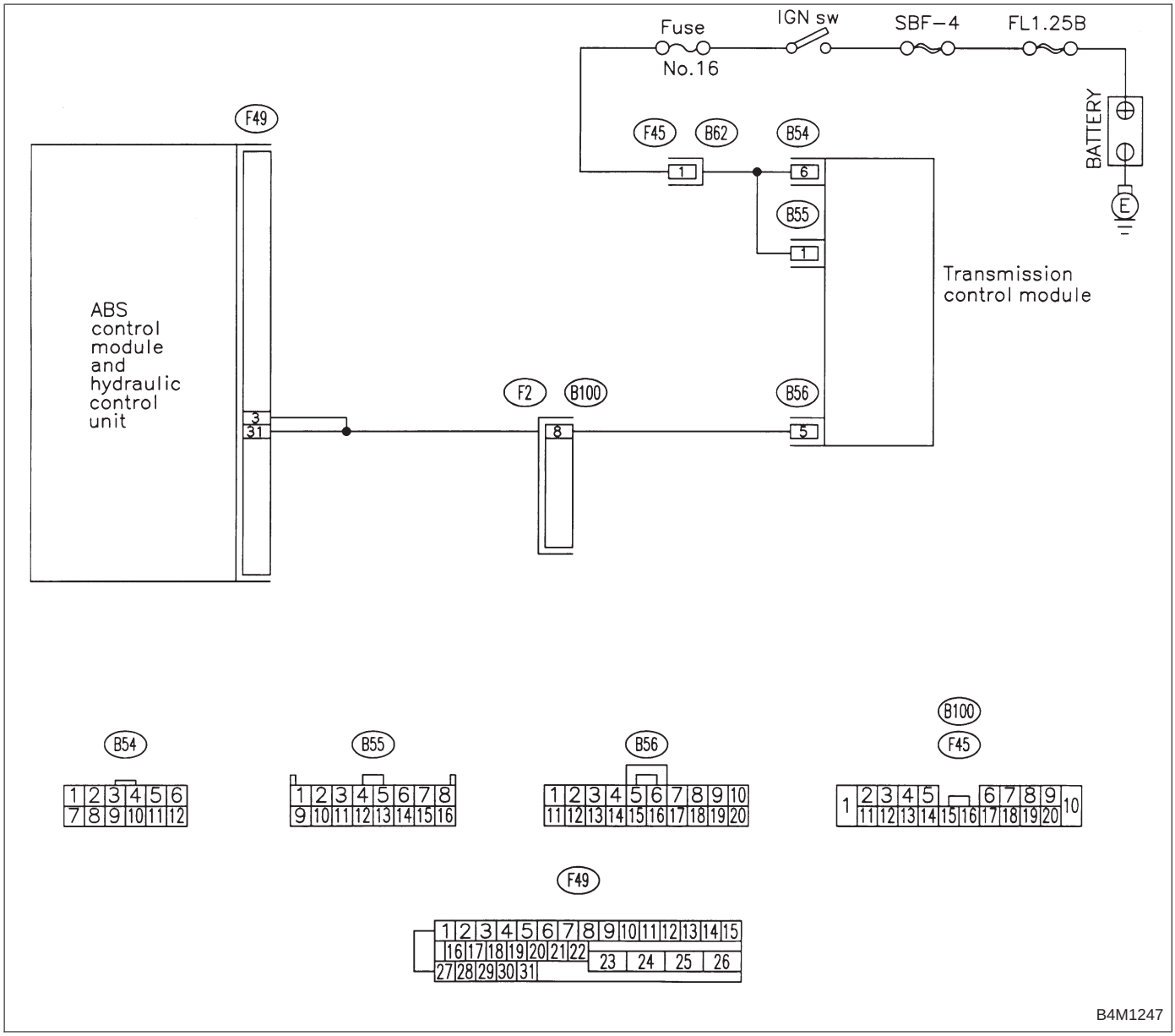
DIAGNOSIS:

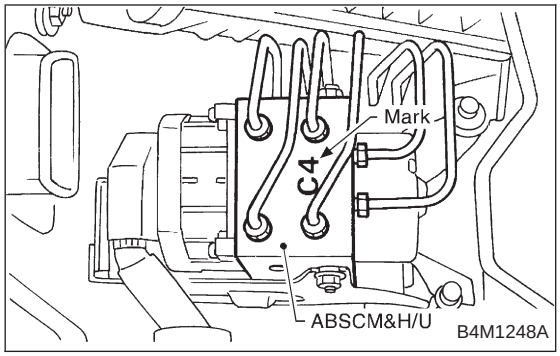
- Combination of AT control faults

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





8U1	CHECK SPECIFICATIONS OF THE ABSCM.

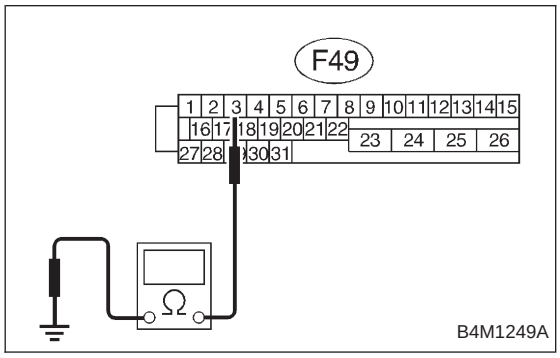
Check specifications of the mark to the ABSCM&H/U.

Mark	Model
C3	AWD AT
C4	AWD MT

CHECK ***: Is an ABSCM&H/U for AT model installed on a MT model?***

YES : Replace ABSCM&H/U.

NO : Go to step **8U2**.



8U2	CHECK GROUND SHORT OF HARNESS.

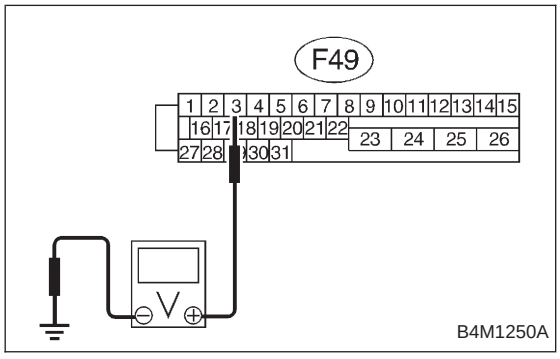
1) Turn ignition switch to OFF.
2) Disconnect two connectors from TCM.
3) Disconnect connector from ABSCM&H/U.
4) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **8U3**.

NO : Repair harness between TCM and ABSCM&H/U.



8U3	CHECK BATTERY SHORT OF HARNESS.

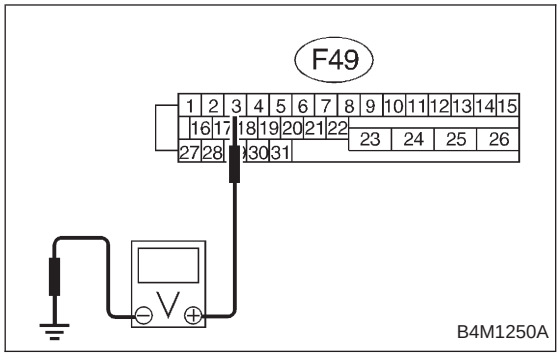
Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **8U4**.

NO : Repair harness between TCM and ABSCM&H/U.



8U4	CHECK BATTERY SHORT OF HARNESS.

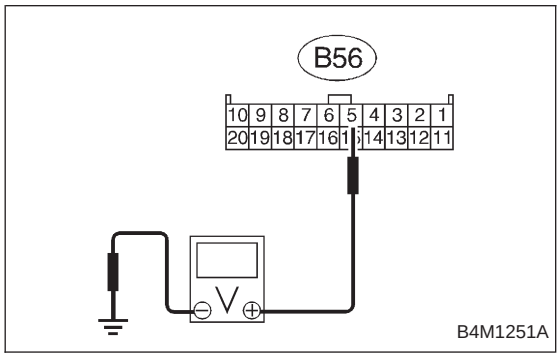
1) Turn ignition switch to ON.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **8U5**.

NO : Repair harness between TCM and ABSCM&H/U.



8U5	CHECK TCM.

1) Turn ignition switch to OFF.
2) Connect all connectors to TCM.
3) Turn ignition switch to ON.
4) Measure voltage between TCM connector terminal and chassis ground.

Connector & terminal
(B56) No. 5 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **8U7**.

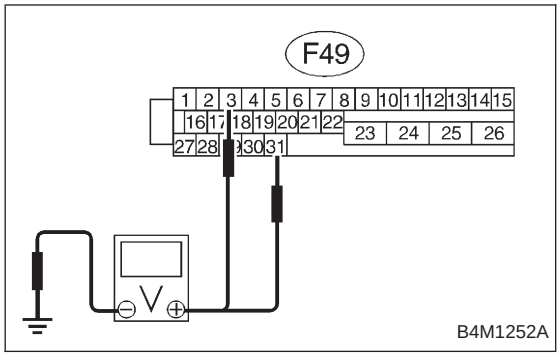
NO : Go to step **8U6**.

8U6	CHECK AT.

CHECK ***: Is the AT functioning normally?***

YES : Replace TCM.

NO : Repair AT.



8U7	CHECK OPEN CIRCUIT OF HARNESS.

Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (−):
(F49) No. 31 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **8U8**.

NO : Repair harness/connector between TCM and ABSCM&H/U.

8U8	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between TCM and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **8U9**.

8U9	CHECK ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8U10**.

8U10	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

V: TROUBLE CODE 51
— ABNORMAL VALVE RELAY —

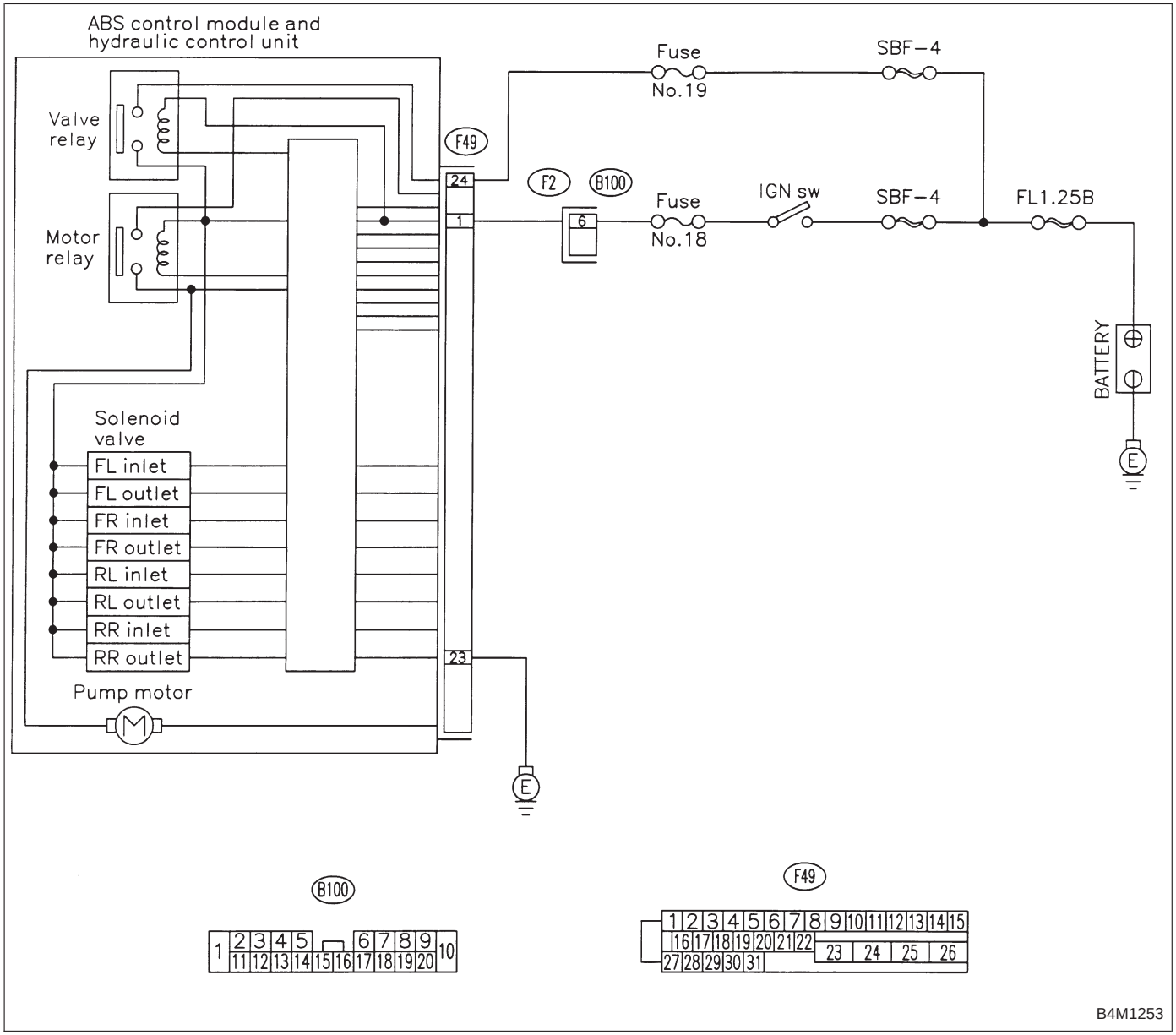
DIAGNOSIS:

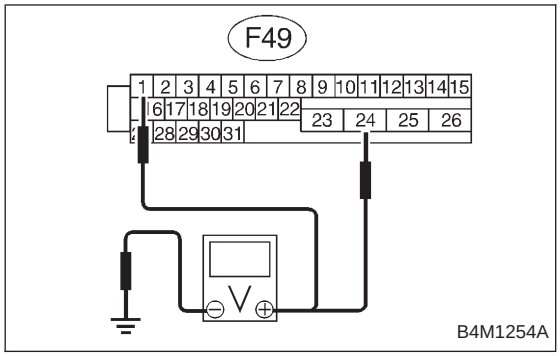
- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





8V1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

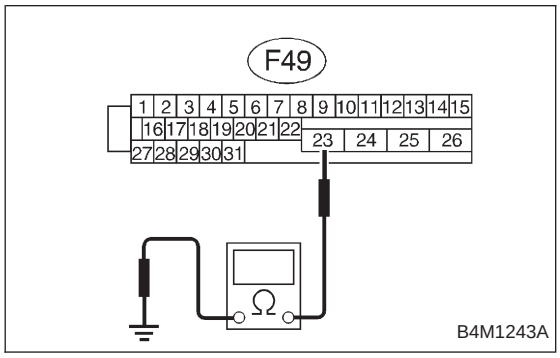
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Run the engine at idle.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (−):
(F49) No. 24 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **8V2**.

NO : Repair harness connector between battery and ABSCM&H/U.



8V2	CHECK GROUND CIRCUIT OF ABSCM&H/U.

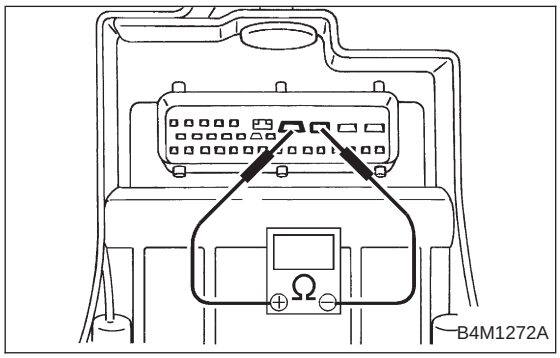
1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **8V3**.

NO : Repair ABSCM&H/U ground harness.



8V3	CHECK VALVE RELAY IN ABSCM&H/U.

Measure resistance between ABSCM&H/U and terminals.

Terminals
No. 23 (+) — No. 24 (−):

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **8V4**.

NO : Replace ABSCM&H/U.

8V4	**CHECK POOR CONTACT IN CONNECTORS.**

CHECK : ***Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **8V5**.

8V5	**CHECK ABSCM&H/U.**

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8V6**.

8V6	**CHECK ANY OTHER TROUBLE CODES APPEARANCE.**

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

W: TROUBLE CODE 52 — ABNORMAL MOTOR AND/OR MOTOR RELAY —

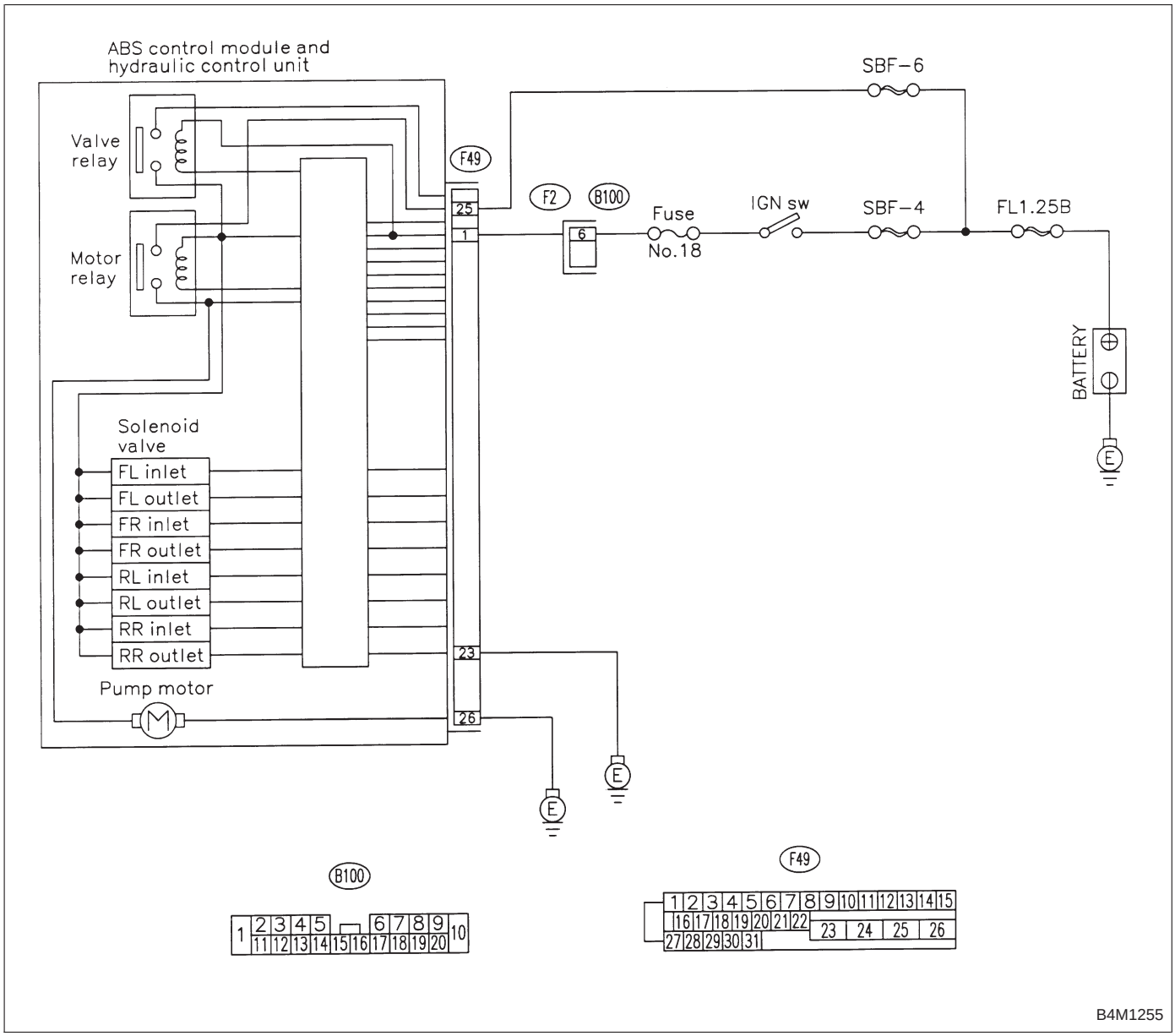
DIAGNOSIS:

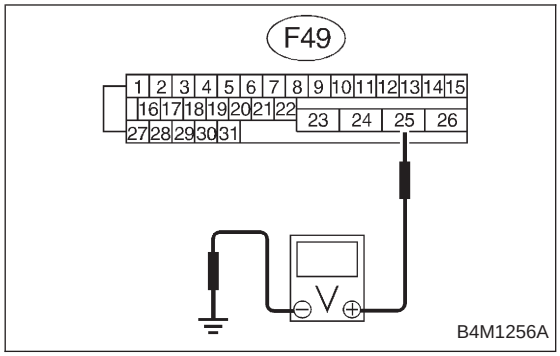
- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





8W1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

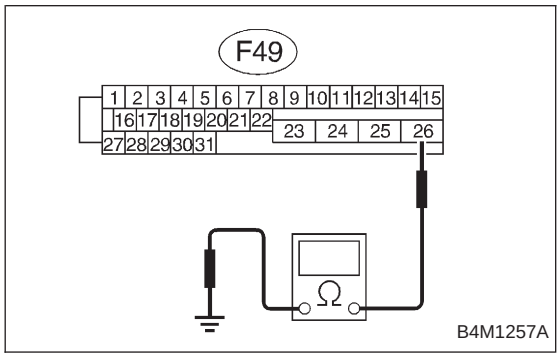
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Turn ignition switch to ON.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 25 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **8W2**.

NO : Repair harness/connector between battery and ABSCM&H/U and check fuse SBF6.



8W2	CHECK GROUND CIRCUIT OF MOTOR.

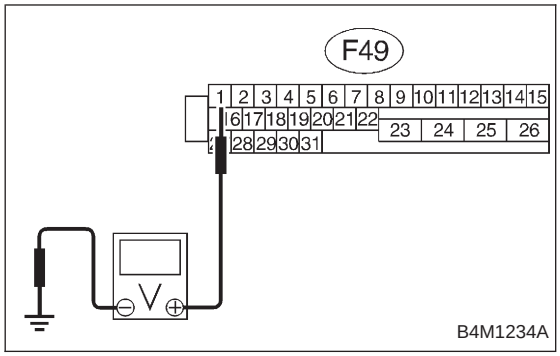
1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 26 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **8W3**.

NO : Repair ABSCM&H/U ground harness.



8W3	CHECK INPUT VOLTAGE OF ABSCM&H/U.

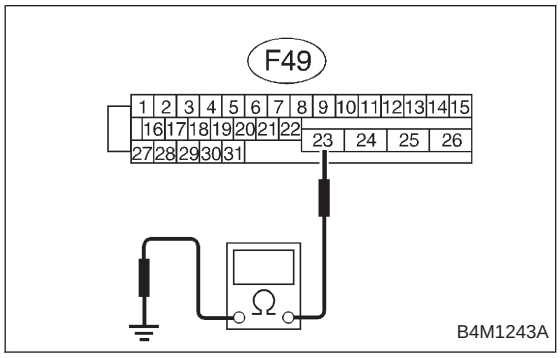
1) Run the engine at idle.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **8W4**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



8W4	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **8W5**.

NO : Repair ABSCM&H/U ground harness.

8W5	CHECK MOTOR OPERATION.

Operate the sequence control. <Ref. to 4-4 [W20D0].>

NOTE:
Use the diagnosis connector to operate the sequence control.

CHECK ***: Can motor revolution noise (buzz) be heard when carrying out the sequence control?***

YES : Go to step **8W6**.

NO : Replace ABSCM&H/U.

8W6	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK ***: Is there poor contact in connector between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **8W7**.

8W7	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8W8**.

8W8	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

X: TROUBLE CODE 54
— ABNORMAL STOP LIGHT SWITCH —

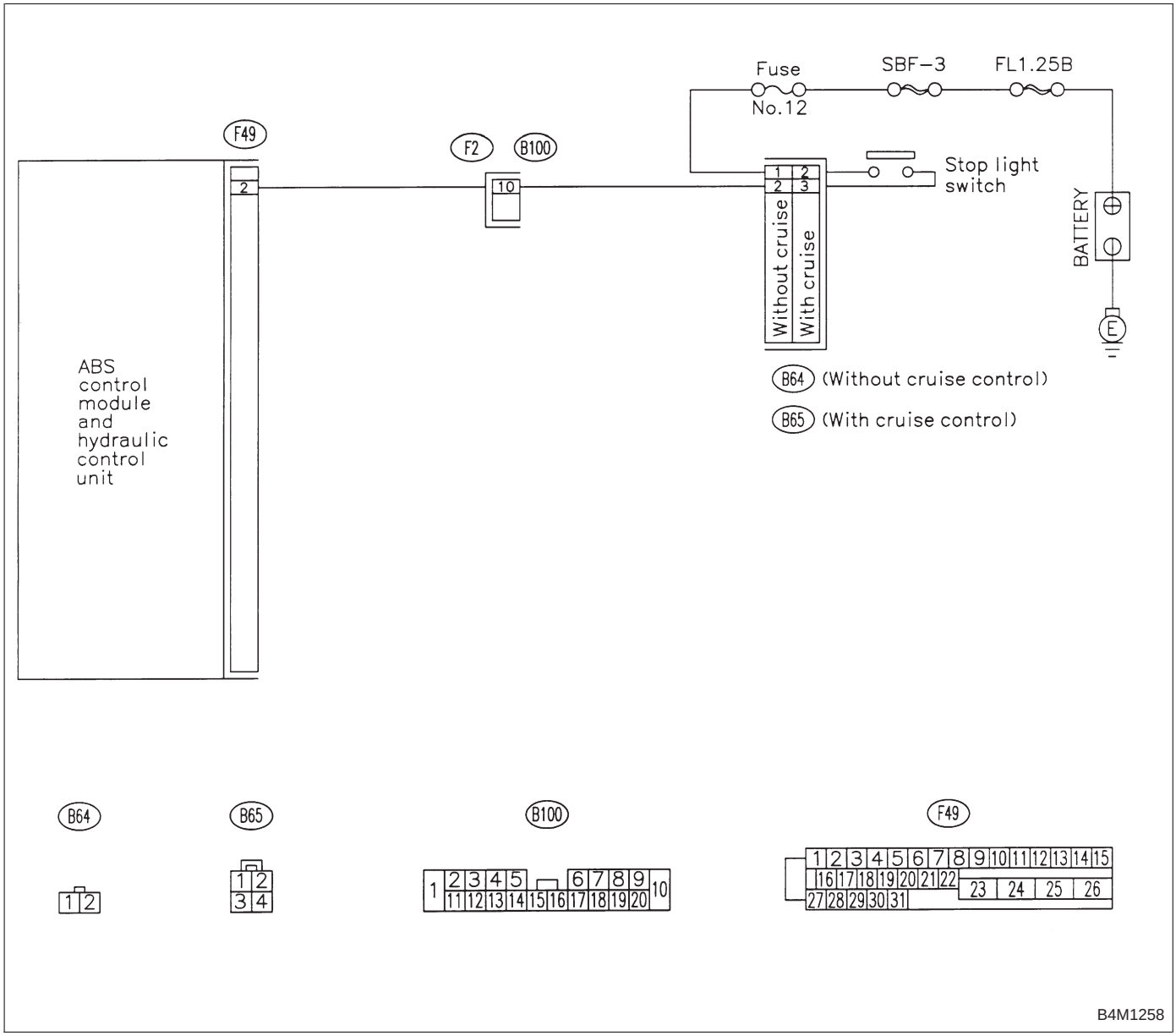
DIAGNOSIS:

- Faulty stop light switch

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



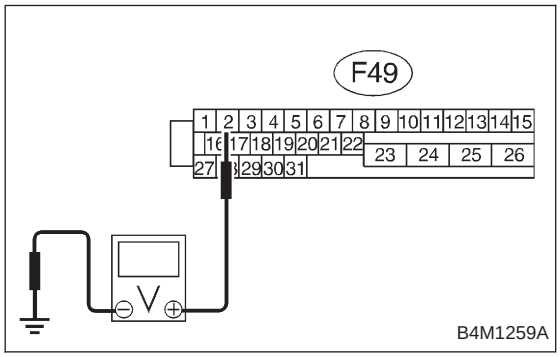
8X1	CHECK STOP LIGHTS COME ON.

Depress the brake pedal.

CHECK ***: Do stop lights come on?***

YES : Go to step **8X2.**

NO : Repair stop lights circuit.



8X2	CHECK OPEN CIRCUIT IN HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Depress brake pedal.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 2 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **8X3**.

NO : Repair harness between stop light switch and ABSCM&H/U.

8X3	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connector between stop light switch and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **8X4**.

8X4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **8X5**.

8X5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

Y: TROUBLE CODE 56 — ABNORMAL G SENSOR OUTPUT VOLTAGE —

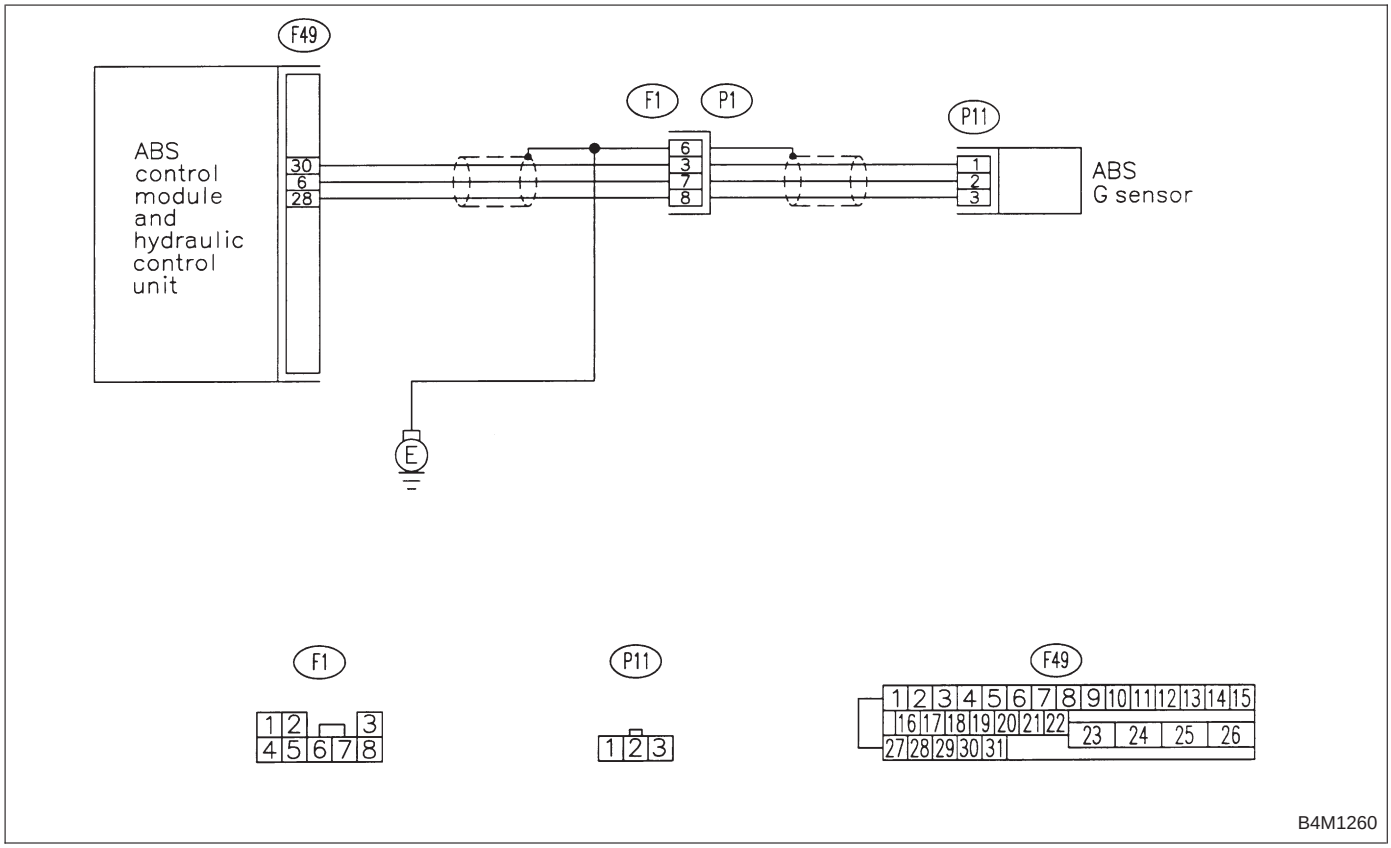
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:

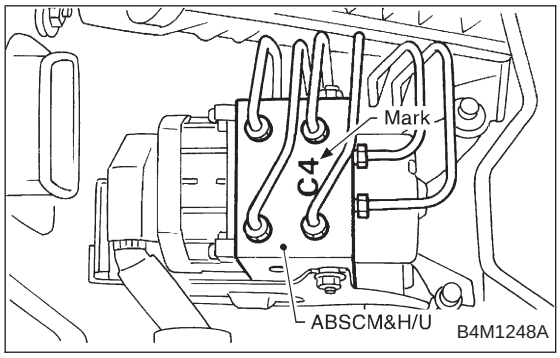


8Y1	CHECK ALL FOUR WHEELS FOR FREE TURNING.

CHECK : ***Have the wheels been turned freely such as when the vehicle is lifted up, or operated on a rolling road?***

YES : The ABS is normal. Erase the trouble code.

NO : Go to step **8Y2**.



8Y2	CHECK SPECIFICATIONS OF ABSCM&H/U.

Check specifications of the mark to the ABSCM&H/U.

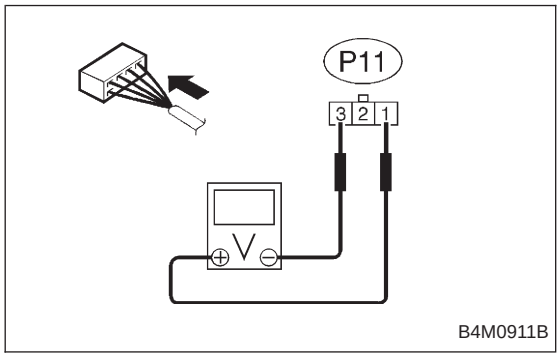
Mark	Model
C3	AWD AT
C4	AWD MT

CHECK : ***Is an ABSCM for AWD model installed on a FWD model?***

CAUTION:
Be sure to turn ignition switch to OFF when removing ABSCM&H/U.

YES : Replace ABSCM&H/U.

NO : Go to step **8Y3**.



8Y3	CHECK INPUT VOLTAGE OF G SENSOR.

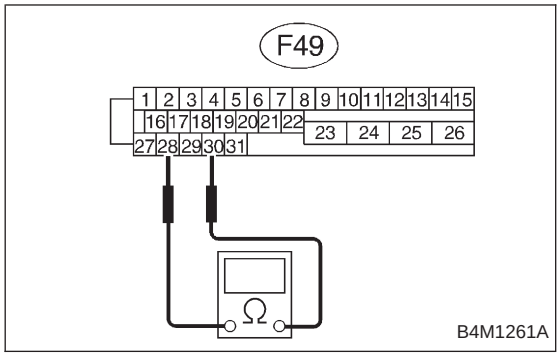
1) Turn ignition switch to OFF.
2) Remove console box.
3) Disconnect G sensor from body. (Do not disconnect connector.)
4) Turn ignition switch to ON.
5) Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 1 (+) — No. 3 (−):

CHECK : ***Is the voltage between 4.75 and 5.25 V?***

YES : Go to step **8Y4**.

NO : Repair harness/connector between G sensor and ABSCM&H/U.



8Y4	CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

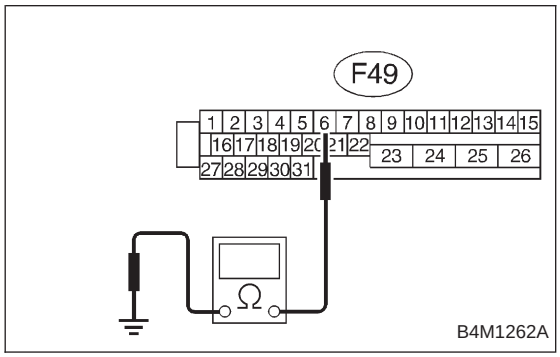
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
(F49) No. 30 — No. 28:

CHECK ***: Is the resistance between 4.3 and 4.9 kΩ?***

YES : Go to step **8Y5**.

NO : Repair harness/connector between G sensor and ABSCM&H/U.



8Y5	CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS.

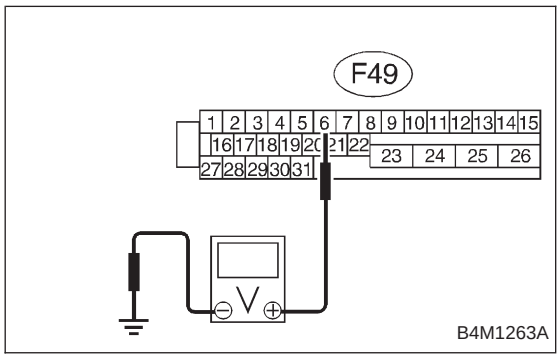
1) Disconnect connector from G sensor.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **8Y6**.

NO : Repair harness between G sensor and ABSCM&H/U.



8Y6	CHECK BATTERY SHORT OF HARNESS.

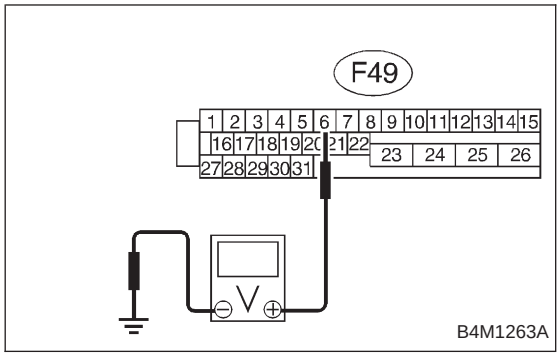
Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **8Y7**.

NO : Repair harness between G sensor and ABSCM&H/U.



8Y7	CHECK BATTERY SHORT OF HARNESS.

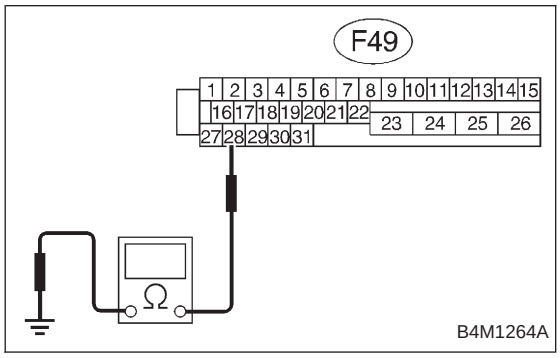
1) Turn ignition switch to ON.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **8Y8**.

NO : Repair harness between G sensor and ABSCM&H/U.



8Y8	CHECK GROUND SHORT OF HARNESS.

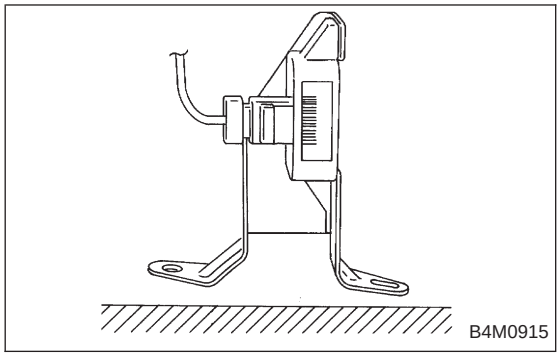
Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 28 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **8Y9**.

NO : Repair harness between G sensor and ABSCM&H/U.
Replace ABSCM&H/U.


B4M0915

8Y9	CHECK G SENSOR.

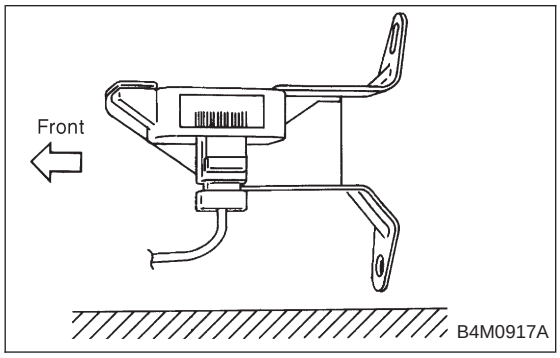
1) Turn ignition switch to OFF.
2) Remove G sensor from vehicle.
3) Connect connector to G sensor.
4) Connect connector to ABSCM&H/U.
5) Turn ignition switch to ON.
6) Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (−):

CHECK ***: Is the voltage between 2.1 and 2.4 V when G sensor is horizontal?***

YES : Go to step **8Y10**.

NO : Replace G sensor.



B4M0917A

8Y10	CHECK G SENSOR.

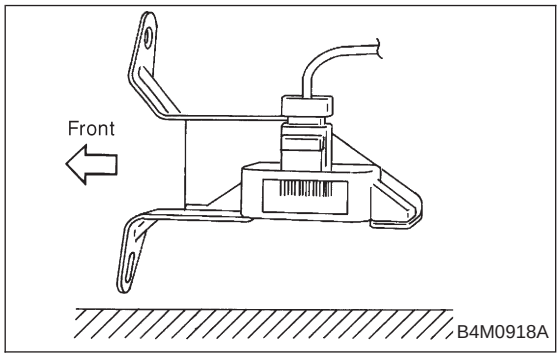
Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (−):

CHECK ***: Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?***

YES : Go to step **8Y11**.

NO : Replace G sensor.



B4M0918A

8Y11	CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (−):

CHECK ***: Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?***

YES : Go to step **8Y12**.

NO : Replace G sensor.

8Y12	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **8Z12**.

8Y13	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

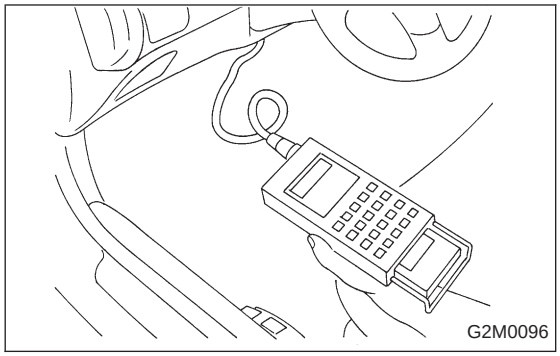
NO : Go to step **8Y14**.

8Y14	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



9. Select Monitor Function Mode

Applicable cartridge of select monitor: No. 498346300

A: LIST OF FUNCTION MODE

1. F MODE (ROM ID, ANALOG DATA ARE DISPLAYED.)

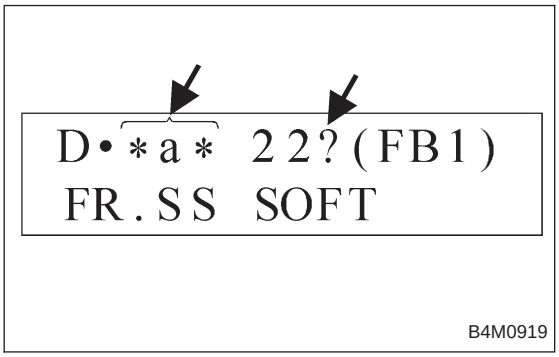
Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
F00	ROM ID	ECM identification	ROM ID number of ECM is read and enabled communication state is displayed.	Possible	4-4d [T9B0]
F01	FR	FR wheel speed (mile/h)	Wheel speed detected by the FR ABS sensor is displayed in mile/h.	Possible	4-4d [T9C0]
F02	FL	FL wheel speed (mile/h)	Wheel speed detected by the FL ABS sensor is displayed in mile/h.	Possible	4-4d [T9D0]
F03	RR	RR wheel speed (mile/h)	Wheel speed detected by the RR ABS sensor is displayed in mile/h.	Possible	4-4d [T9E0]
F04	RL	RL wheel speed (mile/h)	Wheel speed detected by the RL ABS sensor is displayed in mile/h.	Possible	4-4d [T9F0]
F05	FR	FR wheel speed (km/h)	Wheel speed detected by the FR ABS sensor is displayed in km/h.	Possible	4-4d [T9C0]
F06	FL	FL wheel speed (km/h)	Wheel speed detected by the FL ABS sensor is displayed in km/h.	Possible	4-4d [T9D0]
F07	RR	RR wheel speed (km/h)	Wheel speed detected by the RR ABS sensor is displayed in km/h.	Possible	4-4d [T9E0]
F08	RL	RL wheel speed (km/h)	Wheel speed detected by the RL ABS sensor is displayed in km/h.	Possible	4-4d [T9F0]
F09	BLS	Stop light switch monitor	Stop light switch monitor voltage is displayed.	Possible	4-4d [T9G0]
F10	G-SENS	G sensor output voltage (V)	Refers to vehicle acceleration detecting by the analog G sensor. It appears on the select monitor display in volts.	Possible	4-4d [T9H0]

2. FA MODE (ON/OFF DATA ARE DISPLAYED.)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FA0	B1	Stop light switch	LED 1 comes on with the switch on (with the brake pedal down).	Possible	4-4d [T9I0]
	VR	Valve relay signal	LED 2 comes on with the valve relay off.		
	MR	Motor relay signal	LED 3 comes on with the motor on.		
	AT	AT ABS signal	LED 4 comes on when ABS control is on.		
	AW	ABS warning light	LED 6 comes on when the warning light is on.		
	VM	Valve relay monitor	LED 1 comes on with the valve relay off.		
	MM	Motor relay monitor	LED 8 comes on when the motor relay is on.		
	CM	CCM signal	LED 9 comes on when ABS control is on.		

3. FB MODE (TROUBLE CODES ARE DISPLAYED.)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FB1	D·ALL	History of trouble codes is displayed.	A maximum of 3 trouble codes are displayed in order of occurrence.	Possible	4-4d [T10B0]
	D·NEW		The most recent trouble code appears on the select monitor display.		
	D·MID		The second most recent trouble code appears on the select monitor display.		
	D·OLD		The third most recent trouble code appears on the select monitor display.		
	D·REF		A specified period of time proceeding trouble code appears on the select monitor display.		



NOTE:
● If a particular trouble code is not properly stored in memory (due to a drop in ABSCM&H/U power supply, etc.) when a problem occurs, the trouble code, followed by a question mark “?”, appears on the select monitor display. This shows it may be an unreliable reading.
● arefers to the troubles in order of occurrence (NEW. MID, OLD and REF).

4. FC MODE (TROUBLE CODES ARE ERASED.)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FC0	D·CLR	History of trouble codes is erased.	Function of clearing trouble code.	Possible	4-4d [T9J0]

5. FD MODE (ABS SEQUENCE CONTROL MODE)

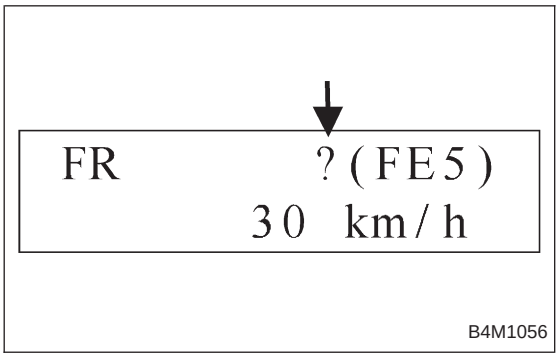
Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FD1	A·CHK	ABS sequence control	Perform ABS sequence control by operating valve and pump motor sequentially.	Impossible	4-4 [W20D2]

6. FE MODE (FREEZE FRAME DATA)

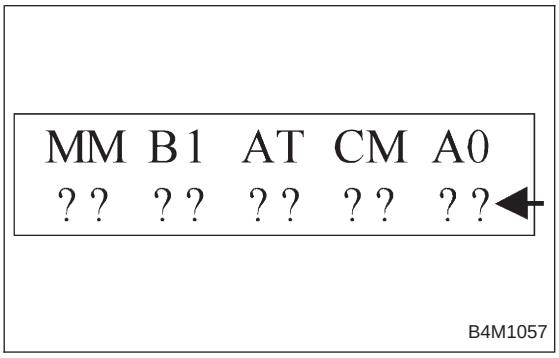
NOTE:
- Data stored at the time of trouble occurrence is shown on display.
- Each time trouble occurs, the latest information is stored in the freeze frame data in memory.

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FE1	FR	FR wheel speed (mile/h)	Wheel speed detected by the FR ABS sensor is displayed in mile/h.	Possible	4-4d [T9K0]
FE2	FL	FL wheel speed (mile/h)	Wheel speed detected by the FL ABS sensor is displayed in mile/h.	Possible	4-4d [T9L0]
FE3	RR	RR wheel speed (mile/h)	Wheel speed detected by the RR ABS sensor is displayed in mile/h.	Possible	4-4d [T9M0]
FE4	RL	RL wheel speed (mile/h)	Wheel speed detected by the RL ABS sensor is displayed in mile/h.	Possible	4-4d [T9N0]
FE5	FR	FR wheel speed (km/h)	Wheel speed detected by the FR ABS sensor is displayed in km/h.	Possible	4-4d [T9K0]
FE6	FL	FL wheel speed (km/h)	Wheel speed detected by the FL ABS sensor is displayed in km/h.	Possible	4-4d [T9L0]
FE7	RR	RR wheel speed (km/h)	Wheel speed detected by the RR ABS sensor is displayed in km/h.	Possible	4-4d [T9M0]
FE8	RL	RL wheel speed (km/h)	Wheel speed detected by the RL ABS sensor is displayed in km/h.	Possible	4-4d [T9N0]
FE13	POWER	ABSCM&H/U power supply voltage (V)	Power (in volts) supplied to ABSCM&H/U appears on the select monitor display.	Possible	4-4d [T9O0]
FE14	G-SENS	G sensor output voltage (V)	Refers to vehicle acceleration detected by the analog G sensor. It appears on the select monitor display in volts.	Possible	4-4d [T9P0]
FE15	MM	Motor relay monitor	LED 1 comes on when motor relay is on.	Possible	4-4d [T9Q0]
	B1	Stop light switch	LED 2 comes on with the stop light switch on (with the brake pedal depressed).		
	AT	AT ABS signal	LED 3 comes on when ABS control is on.		
	CM	CCM signal	LED 4 comes on when ABS control is on.		
	A0	ABS control	LED 5 comes on when ABS control is on.		
FE16	CODE	Trouble code	The most recent trouble code appears on select monitor display.	Possible	4-4d [T9R0]

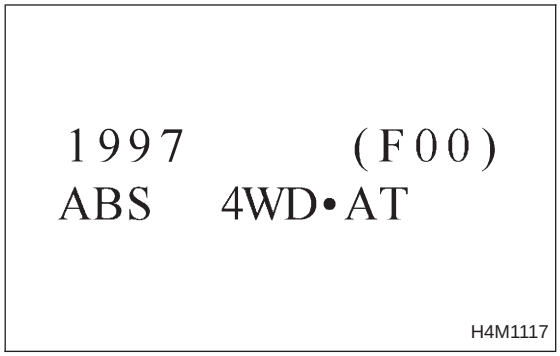
1) When a trouble code is not stored in memory, activating the FE mode causes the initial value to appear on the select monitor display.
- FE1 — 4: 159 mile/h
- FE5 — 8: 255 km/h
- FE13: 18.05 V
- FE14: 5.00 V
- FE15: The MM, B1 and A0 LEDs are on. The AT and CM LEDs are out.
- FE16: NO HISTORY OF OCCURRED



2) If freeze frame data is not properly stored in memory (due to a drop in ABSCM power supply, etc.), a trouble code, preceded by a question mark "?", appears on the select monitor display. This shows it may be an unreliable reading.



3) When a trouble code is detected in the FE mode, a question mark "?" appears continuously on the select monitor display until the freeze frame data is stored in memory.



B: MODE F00 — ROM ID NUMBER (ROM) —

CONDITION:

Ignition switch ON

SPECIFIED DATA:

Presentation display

9B1	CHECK MESSAGE OF DISPLAY.

CHECK ***: Does display indicate message "Error 1"?***

YES : Repair loose or disconnect connector, or discontinued circuit in data link circuit.

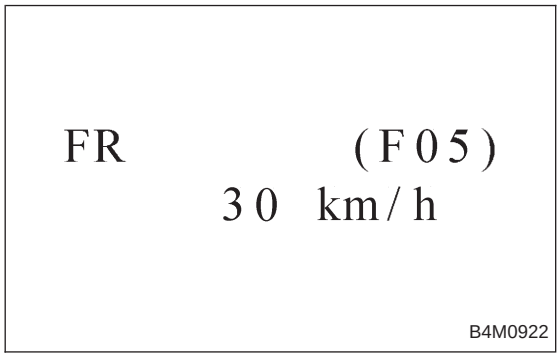
NO : Go to step **9B2**.

9B2	CHECK MESSAGE OF DISPLAY.

CHECK ***: Does display indicate message "Error 2"?***

YES : Repair poor contact of select monitor cartridge, or installation of different type select monitor cartridge.

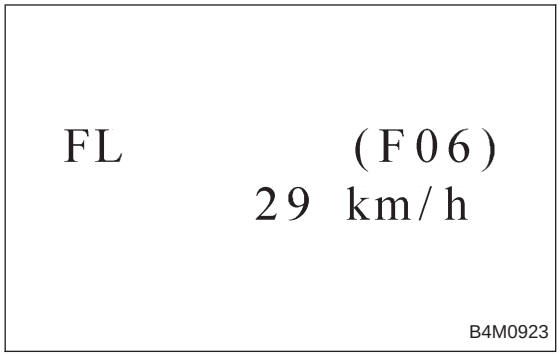
NO : Data link system is normal.



C: MODE F01 AND F05 — FRONT RIGHT WHEEL SPEED SIGNAL (FR) —

- Compare speedometer with monitor indications.
- F01: FR wheel speed is indicated in mile per hour (mile/h).
- F05: FR wheel speed is indicated in kilometer per hour (km/h).

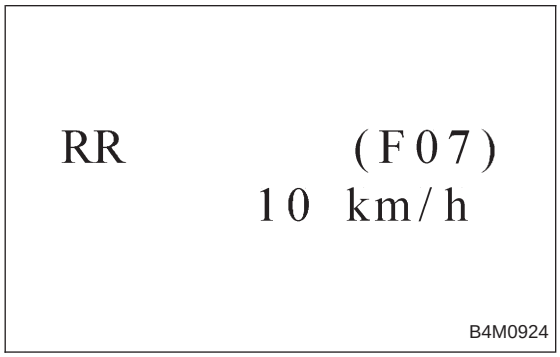
NOTE:
The monitor as shown, indicates that FR wheel speed is 30 km/h.



D: MODE F02 AND F06 — FRONT LEFT WHEEL SPEED SIGNAL (FL) —

- Compare speedometer with monitor indications.
- F02: FL wheel speed is indicated in mile per hour (mile/h).
- F06: FL wheel speed is indicated in kilometer per hour (km/h).

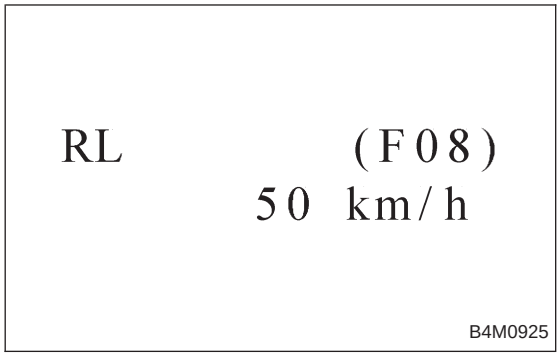
NOTE:
The monitor as shown, indicates that FL wheel speed is 29 km/h.



E: MODE F03 AND F07 — REAR RIGHT WHEEL SPEED SIGNAL (RR) —

- Compare speedometer with monitor indications.
- F03: RR wheel speed is indicated in mile per hour (mile/h).
- F07: RR wheel speed is indicated in kilometer per hour (km/h).

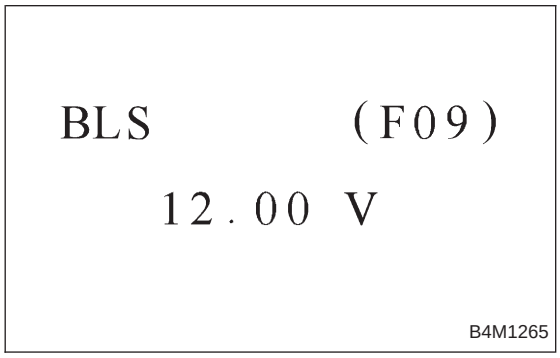
NOTE:
The monitor as shown, indicates that RR wheel speed is 10 km/h.



F: MODE F04 AND F08 — REAR LEFT WHEEL SPEED SIGNAL (RL) —

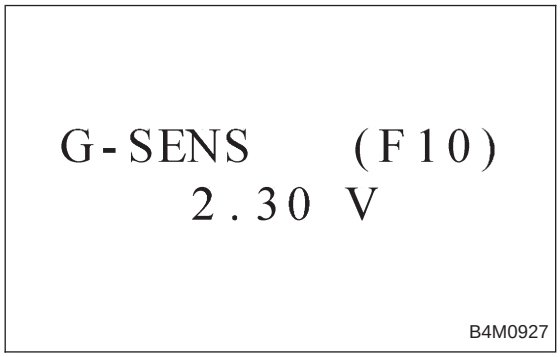
- Compare speedometer with monitor indications.
- F04: RL wheel speed is indicated in mile per hour (mile/h).
- F08: RL wheel speed is indicated in kilometer per hour (km/h).

NOTE:
The monitor as shown, indicates that RL wheel speed is 50 km/h.



G: MODE F09 — STOP LIGHT SWITCH MONITOR (BLS) —

- Stop light switch monitor voltage is displayed.

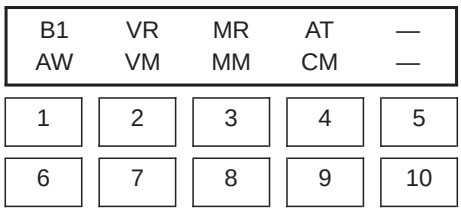


H: MODE F10 — G SENSOR OUTPUT VOLTAGE (G-SENS) —

- Refers to vehicle acceleration detecting by the analog G sensor. It appears on the select monitor display in volts.

NOTE:
Only AWD model

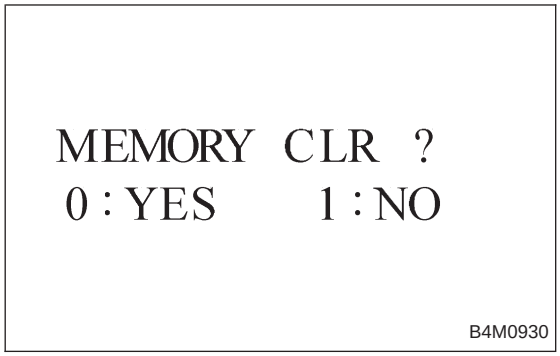
LED No.	Signal name	Display
1	Stop light switch	B1
2	Valve relay signal	VR
3	Motor relay signal	MR
4	AT ABS signal	AT
5	—	—
6	ABS warning light	AW
7	Valve relay monitor	VM
8	Motor relay monitor	MM
9	CCM signal	CM
10	—	—



I: MODE FA0
— ON ↔ OFF SIGNAL —

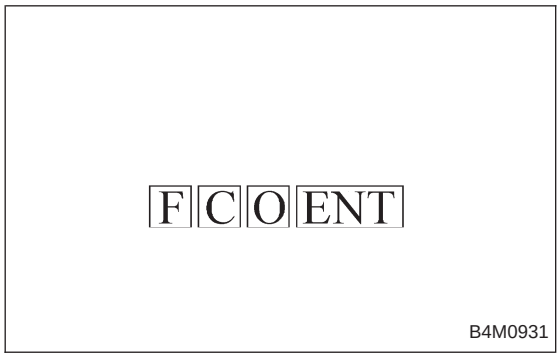
Requirement for LED “ON”

LED No. 1 Stop light switch is turned ON. (With brake pedal depressed.)
LED No. 2 Valve relay is turned OFF.
LED No. 3 Motor relay is turned ON.
LED No. 4 ABS control operates.
LED No. 6 ABS warning light is ON.
LED No. 7 Valve relay is turned OFF.
LED No. 8 Motor relay is turned ON.
LED No. 9 ABS control operates.

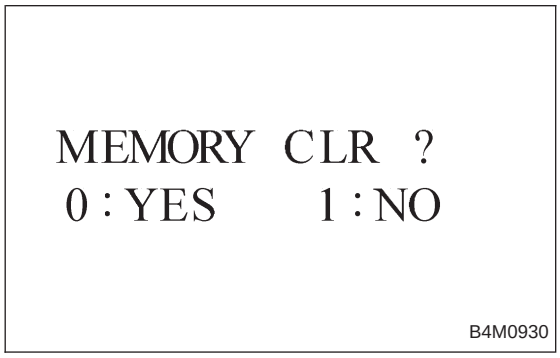


J: MODE FC0 — HISTORY OF TROUBLE CODES IS ERASED (D·CLR) —

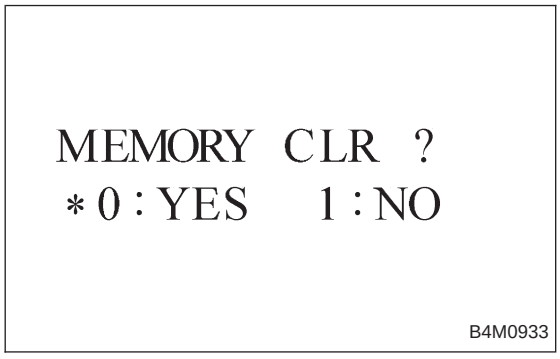
● Deletes the recorded trouble codes in ABS control module.



1) Press the function key [F] [C] [O] [ENT] in that order.

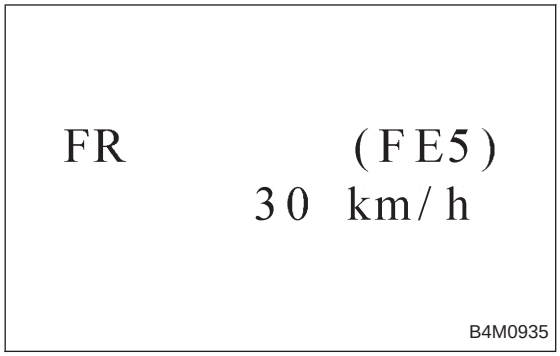


2) System indicates as shown.



3) Press the function key [0], to clear memories. The indication of ∗ is added to screen.

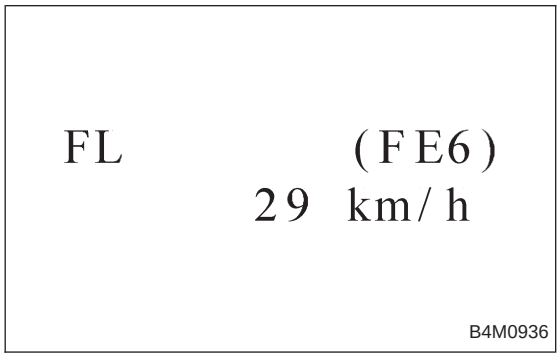
4) Press the function key [ENT]. System indicates as shown.
5) Turn ignition switch to OFF.



K: MODE FE1 AND FE5 — FRONT RIGHT WHEEL SPEED SIGNAL (FR) —

- The wheel speed is indicated at the time of malfunction.
- FE1: FR wheel speed is indicated in mile per hour (mile/h).
- FE5: FR wheel speed is indicated in kilometer per hour (km/h).

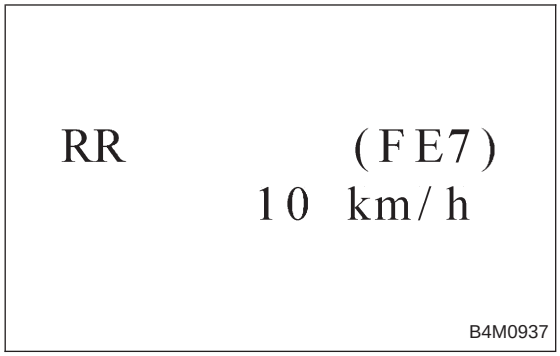
NOTE:
The monitor as shown, indicates that FR wheel speed is 30 km/h.



L: MODE FE2 AND FE6 — FRONT LEFT WHEEL SPEED SIGNAL (FL) —

- The wheel speed is indicated at the time of malfunction.
- FE2: FL wheel speed is indicated in mile per hour (mile/h).
- FE6: FL wheel speed is indicated in kilometer per hour (km/h).

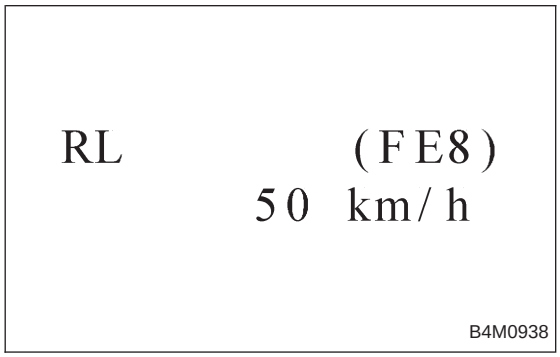
NOTE:
The monitor as shown, indicates that FL wheel speed is 29 km/h.



M: MODE FE3 AND FE7 — REAR RIGHT WHEEL SPEED SIGNAL (RR) —

- The wheel speed is indicated at the time of malfunction.
- FE3: RR wheel speed is indicated in mile per hour (mile/h).
- FE7: RR wheel speed is indicated in kilometer per hour (km/h).

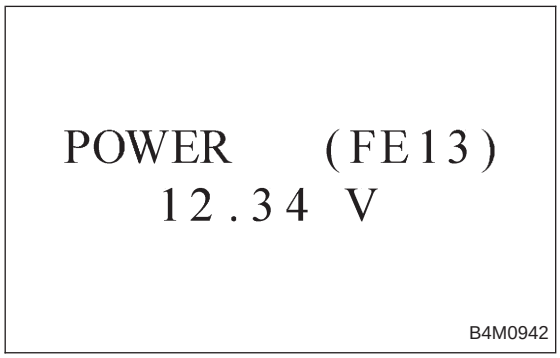
NOTE:
The monitor as shown, indicates that RR wheel speed is 10 km/h.



N: MODE FE4 AND FE8 — REAR LEFT WHEEL SPEED SIGNAL (RL) —

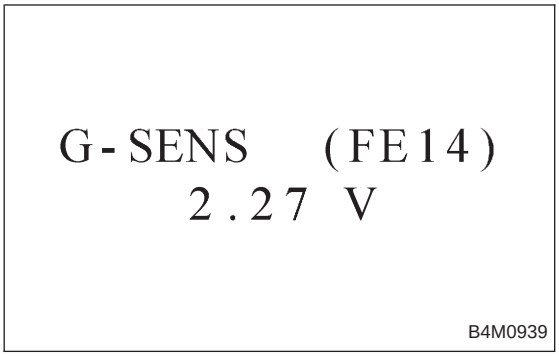
- The wheel speed is indicated at the time of malfunction.
- FE4: RL wheel speed is indicated in mile per hour (mile/h).
- FE8: RL wheel speed is indicated in kilometer per hour (km/h).

NOTE:
The monitor as shown, indicates that RL wheel speed is 50 km/h.



O: MODE FE13 — ABSCM&H/U POWER SUPPLY VOLTAGE (POWER) —

- ABSCM&H/U power supply voltage is indicated at the time of malfunction.

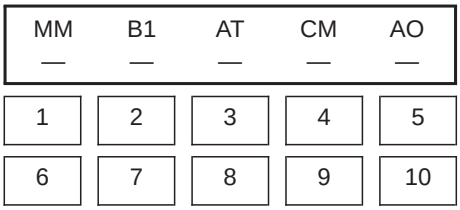


P: MODE FE14 — G SENSOR OUTPUT VOLTAGE (G-SENS) —

● Refers to vehicle acceleration detected by the analog G sensor at the time of malfunction. It appears on the select monitor display in volts.

NOTE:
Only AWD model

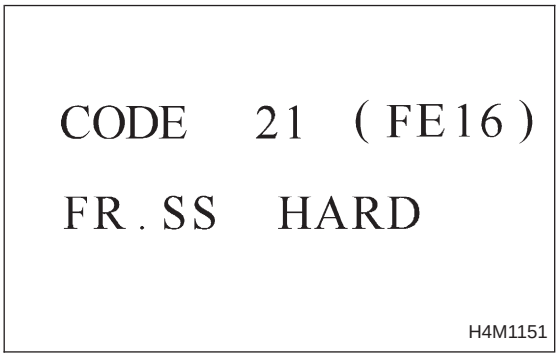
LED No.	Signal name	Display
1	Motor relay monitor	MM
2	Stop light switch	B1
3	AT ABS signal	AT
4	CCM signal	CM
5	ABS signal	AO
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—



Q: MODE FE15 — ON ↔ OFF SIGNAL —

● ON or OFF is indicated at the time of malfunction.
● Requirement for LED “ON”

LED No. 1 Motor relay is turned ON.
LED No. 2 Stop light switch is turned ON. (With brake pedal depressed.)
LED No. 3 ABS control operates.
LED No. 4 ABS control operates.
LED No. 5 ABS control operates.



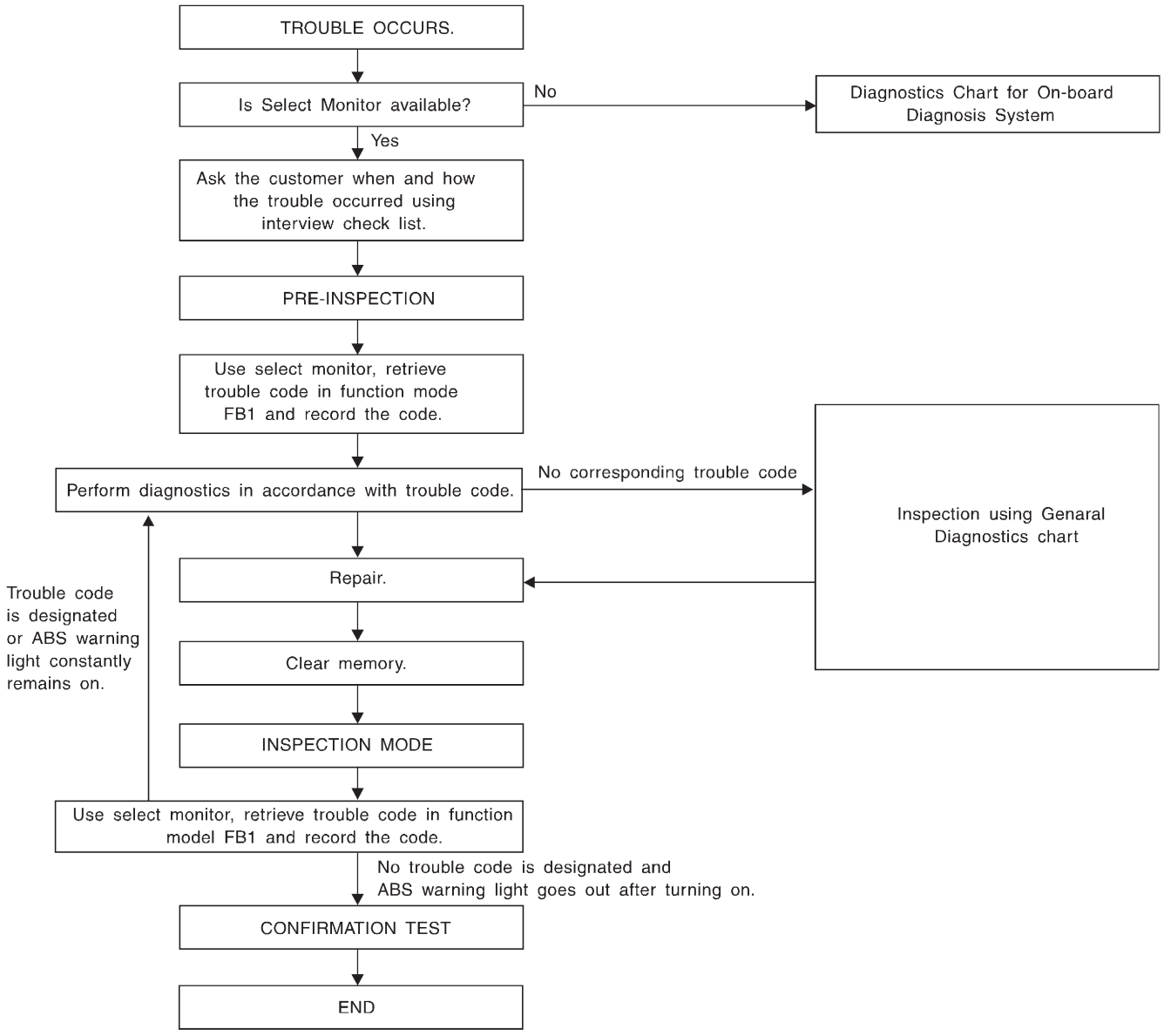
R: MODE FE16 — TROUBLE CODE (CODE) —

● When freeze frame data is stored in memory, trouble code appears on monitor.

NOTE:
The monitor as shown, indicates trouble code 21.

10. Diagnostics Chart with Select Monitor

A: BASIC DIAGNOSTIC CHART



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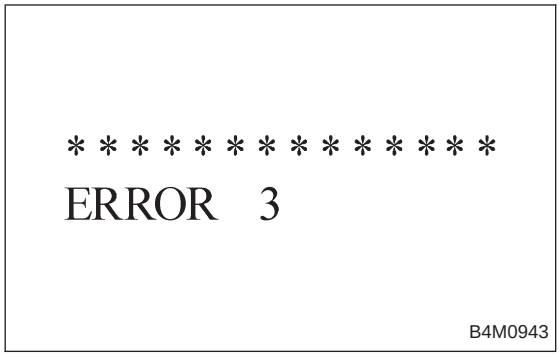
CAUTION:
Remove foreign matter (dust, water, etc.) from the ABSCM&H/U connector during removal and installation.

NOTE:
To check harness for broken wires or short circuits, shake it while holding it or the connector.

B: LIST OF TROUBLE CODE

Code	Display screen (FB1)	Contents of diagnosis	Ref. to
—	ERROR 3 (1)	Select monitor communication failure	4-4d [T10C0]
11	NO TROUBLE	Although no trouble appears on the select monitor display, the ABS warning light remains on.	4-4d [T10D0]
21	FR. SS HARD	Open circuit or input voltage too high of FR sensor	4-4d [T10E0]
22	FR. SS SOFT	Abnormal ABS sensor signal of FR sensor	4-4d [T10I0]
23	FL. SS HARD	Open circuit or input voltage too high of FL sensor	4-4d [T10F0]
24	FL. SS SOFT	Abnormal ABS sensor signal of FL sensor	4-4d [T10J0]
25	RR. SS HARD	Open circuit or input voltage too high of RR sensor	4-4d [T10G0]
26	RR. SS SOFT	Abnormal ABS sensor signal of RR sensor	4-4d [T10K0]
27	RL. SS HARD	Open circuit or input voltage too high of RL sensor	4-4d [T10H0]
28	RL. SS SOFT	Abnormal ABS sensor signal of RL sensor	4-4d [T10L0]
29	EITHER. SS SOFT	Abnormal ABS sensor signal (any one of four)	4-4d [T10M0]
31	FR. EV VALVE	Abnormal FR inlet valve	4-4d [T10N0]
32	FR. AV VALVE	Abnormal FR outlet valve	4-4d [T10R0]
33	FL. EV VALVE	Abnormal FL inlet valve	4-4d [T10O0]
34	FL. AV VALVE	Abnormal FL outlet valve	4-4d [T10S0]
35	RR. EV VALVE	Abnormal RR inlet valve	4-4d [T10P0]
36	RR. AV VALVE	Abnormal RR outlet valve	4-4d [T10T0]
37	RL. EV VALVE	Abnormal RL inlet valve	4-4d [T10Q0]
38	RL. AV VALVE	Abnormal RL outlet valve	4-4d [T10U0]
41	ECU	Abnormal ABSCM&H/U	4-4d [T10V0]
42	LOW VOLTAGE	Source voltage is low.	4-4d [T10W0]
	HIGH VOLTAGE	Source voltage is high.	4-4d [T10X0]
44	CCM LINE	A combination of AT control abnormals (ABS not in control)	4-4d [T10Y0]
	CCM OPEN	A combination of AT control abnormals (ABS in control)	4-4d [T10Z0]
51	V. RELAY	Abnormal valve relay	4-4d [T10AA0]
	V. RELAY ON	Valve relay ON failure	4-4d [T10AB0]
52	M. RELAY OPEN	Open circuit of motor relay	4-4d [T10AC0]
	M. RELAY ON	Motor relay ON failure	4-4d [T10AD0]
	MOTOR	Abnormal motor	4-4d [T10AE0]
54	BLS	Abnormal stop light switch	4-4d [T10AF0]
56	G SENSOR LINE	Open or short circuit of G sensor	4-4d [T10AG0]
	G SENSOR +B	Battery short of G sensor	4-4d [T10AH0]
	G SENSOR H μ	Abnormal G sensor high μ output	4-4d [T10AI0]
	G SENSOR STICK	G sensor output is stuck.	4-4d [T10AJ0]

NOTE:
High μ means high friction coefficient against road surface.



C: ERROR 3 (1) — SELECT MONITOR COMMUNICATION FAILURE —

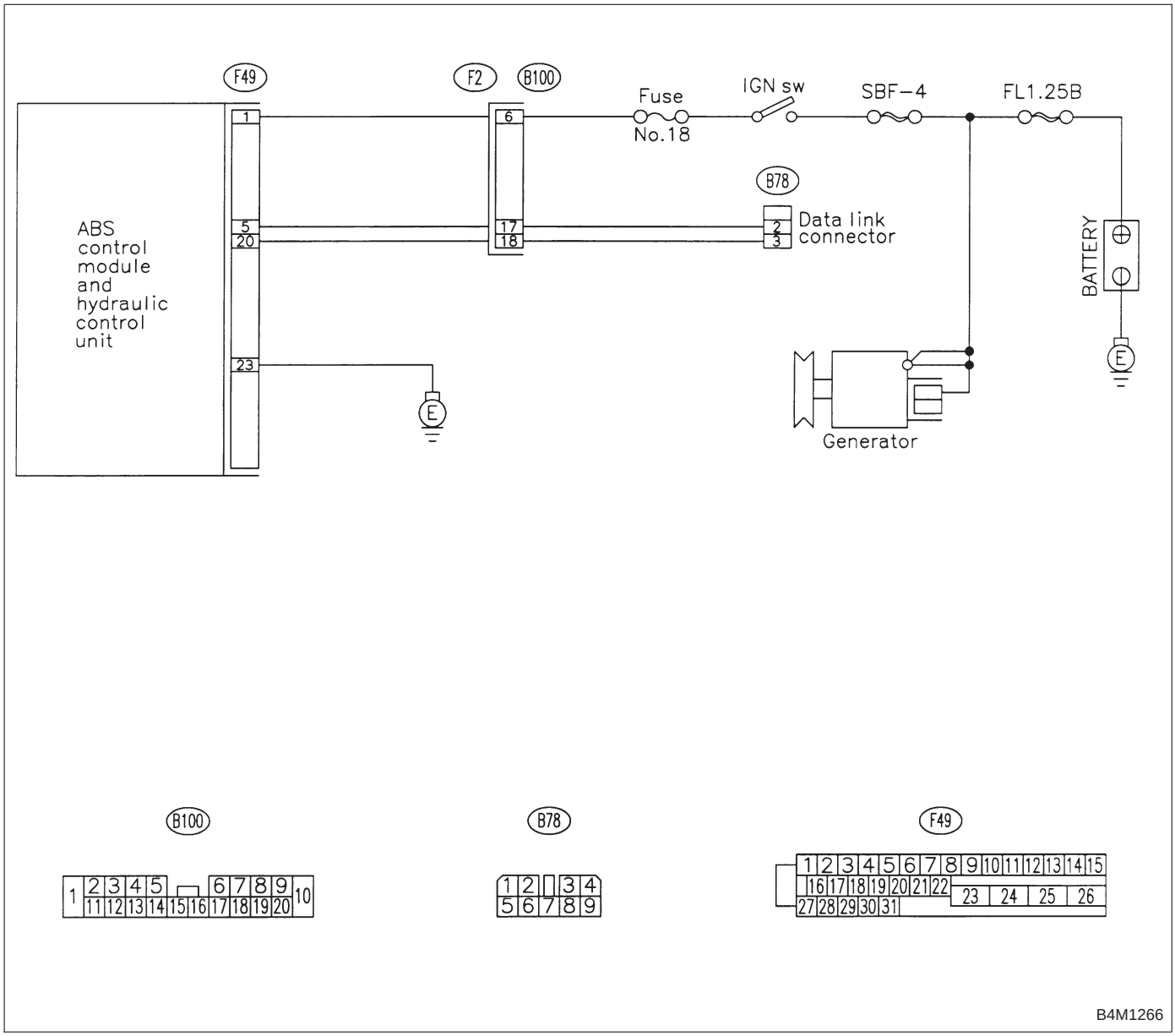
DIAGNOSIS:

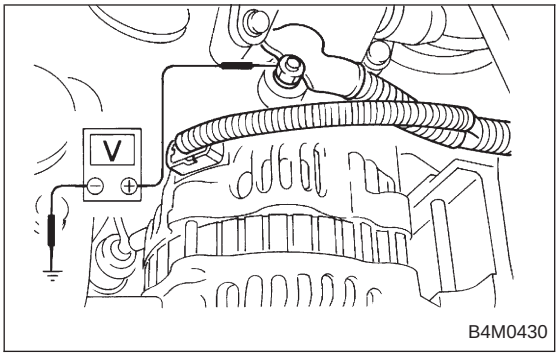
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS warning light remains on.
- ERROR 3 or 1 appears on the select monitor display.

WIRING DIAGRAM:





10C1	CHECK GENERATOR.

1) Start the engine.
2) Idle the engine.
3) Measure voltage between generator and chassis ground.

Terminal
Generator B terminal (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 and 15 V?***
YES : Go to step **10C2**.
NO : Repair generator.

10C2	CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

CHECK ***: Is there poor contact at battery terminal?***
YES : Repair battery terminal.
NO : Go to step **10C3**.

10C3	CHECK COMMUNICATION OF SELECT MONITOR.

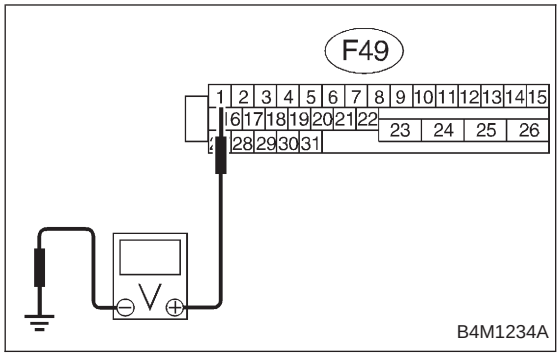
Using the select monitor, check whether communication to other system (such as engine, AT, etc.) can be executed normally.

CHECK ***: Are the name and year of the system displayed on the select monitor?***
YES : Go to step **10C4**.
NO : Repair select monitor communication cable and connector.

10C4	CHECK INSTALLATION OF ABSCM&H/U CONNECTOR.

Turn ignition switch to OFF.

CHECK ***: Is ABSCM&H/U connector inserted into ABSCM&H/U until the clamp locks onto it?***
YES : Go to step **10C5**.
NO : Insert ABSCM&H/U connector into ABSCM&H/U until the clamp locks onto it.



10C5	CHECK POWER SUPPLY OF ABSCM&H/U.

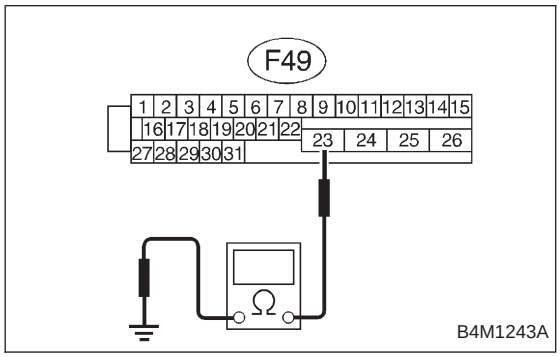
1) Disconnect connector from ABSCM&H/U.
2) Start engine.
3) Idle the engine.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 and 15 V?***

YES : Go to step **10C6**.

NO : Repair ABSCM&H/U power supply circuit.



10C6	CHECK GROUND CIRCUIT OF ABSCM&H/U.

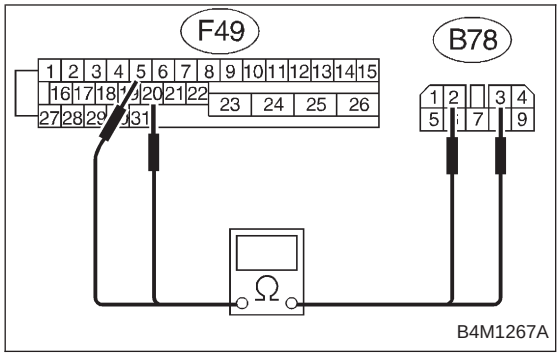
1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Repair harness/connector between ABSCM&H/U and select monitor.

NO : Go to step **10C7**.



10C7	CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND DATA LINK CONNECTOR.

1) Turn ignition switch OFF.
2) Measure resistance between ABSCM&H/U connector and data link connector.

Connector & terminal
(F49) No. 20 — (B78) No. 3:
(F49) No. 5 — (B78) No. 2:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Repair harness and connector between ABSCM&H/U and data link connector.

NO : Go to step **10C8**.

10C8	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between ABSCM&H/U and data link connector? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Replace ABSCM&H/U.

D•ALL 11 (FB1)
NO TROUBLE

B4M0944

D: NO TROUBLE — ALTHOUGH NO TROUBLE APPEARS ON THE SELECT MONITOR DISPLAY, THE ABS WARNING LIGHT REMAINS ON —

DIAGNOSIS:

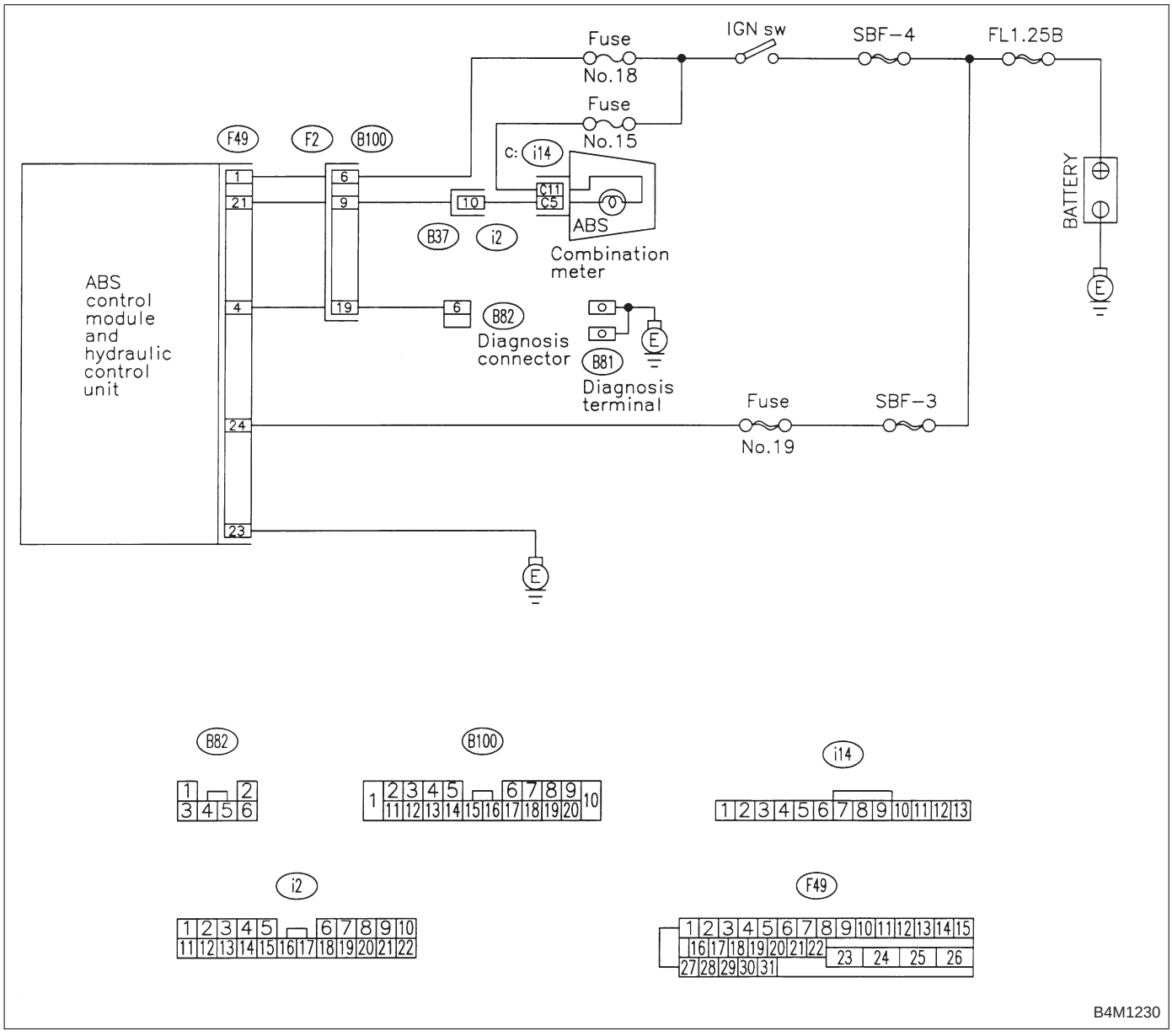
- ABS warning light circuit is shorted.

TROUBLE SYMPTOM:

- ABS warning light remains on.
- NO TROUBLE displayed on the select monitor.

NOTE:
When the ABS warning light is OFF and “NO TROUBLE” is displayed on the select monitor, the system is in normal condition.

WIRING DIAGRAM:



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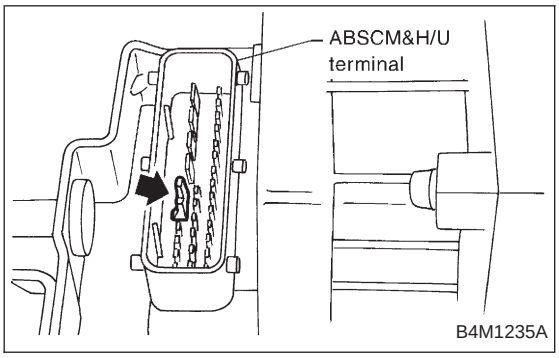
10D1	CHECK WIRING HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector (F2) from connector (B100).
3) Turn ignition switch to ON.

CHECK ***: Does the ABS warning light remain off?***

YES : Go to step **10D2**.

NO : Repair front wiring harness.



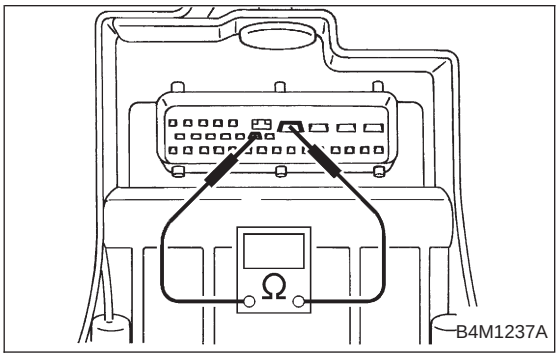
10D2	CHECK PROJECTION AT ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Check for broken projection at the ABSCM&H/U terminal.

CHECK ***: Are the projection broken?***

YES : Go to step **10D3**.

NO : Replace ABSCM&H/U.



10D3	CHECK ABSCM&H/U.

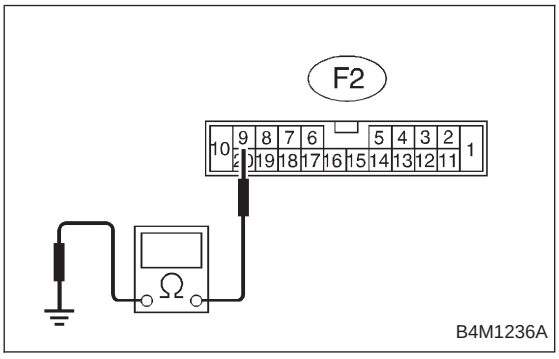
Measure resistance between ABSCM&H/U terminals.

Terminals
No. 21 — No. 23:

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **10D4**.

NO : Replace valve relay.



10D4	CHECK WIRING HARNESS.

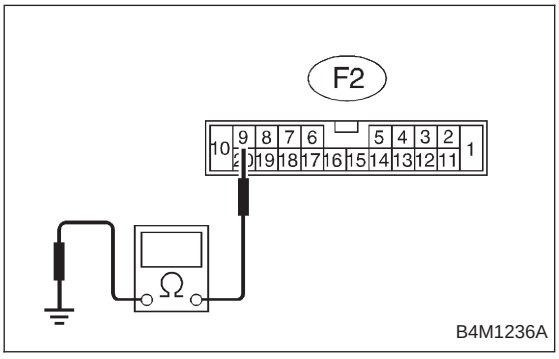
Measure resistance between connector (F2) and chassis ground.

Connector & terminal
(F2) No. 9 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **10D5**.

NO : Repair harness.



10D5	CHECK WIRING HARNESS.

1) Connect connector to ABSCM&H/U.
2) Measure resistance between connector (F2) and chassis ground.

Connector & terminal
(F2) No. 9 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **10D6**.

NO : Repair harness.

10D6	CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR.

CHECK ***: Is there poor contact in ABSCM&H/U connector? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Replace ABSCM&H/U.

E: TROUBLE CODE 21 FR. SS HARD — ABNORMAL FRONT RH ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —

F: TROUBLE CODE 23 FL. SS HARD — ABNORMAL FRONT LH ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —

G: TROUBLE CODE 25 RR. SS HARD — ABNORMAL REAR RH ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —

H: TROUBLE CODE 27 RL. SS HARD — ABNORMAL REAR LH ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —

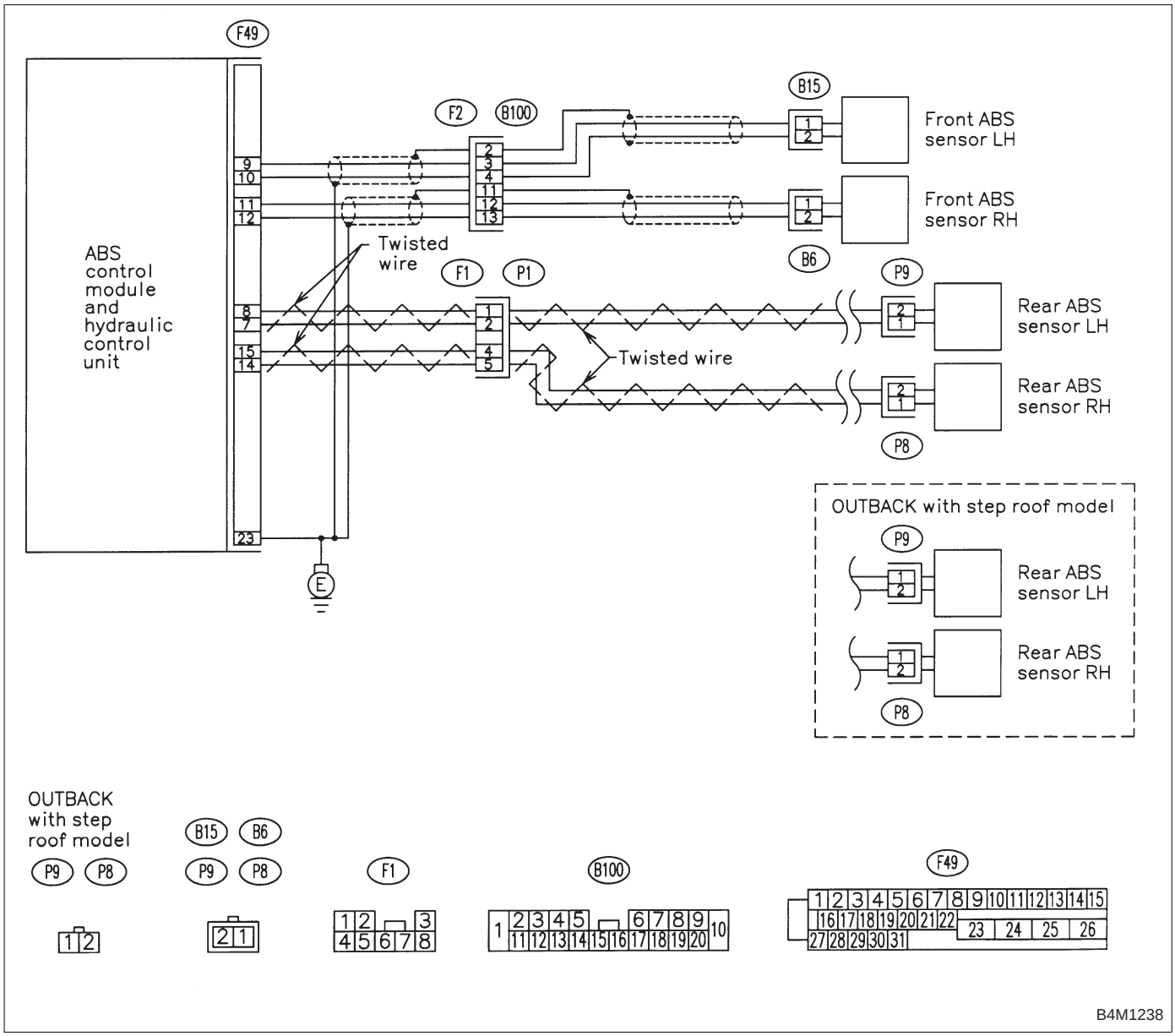
DIAGNOSIS:

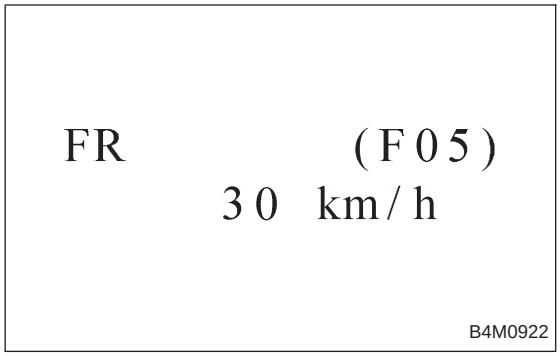
- Faulty ABS sensor (Broken wire, input voltage too high)
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10H1	CHECK OUTPUT OF ABS SENSOR USING SELECT MONITOR.

Read the ABS sensor output corresponding to the faulty system in the select monitor function mode.

NOTE:
The select monitor display shows that the front right wheel is rotating at 30 km/h.

CHECK ***: Does the speed indicated on the display change in response to the speedometer reading during acceleration/deceleration when the steering wheel is in the straight-ahead position?***

YES : Go to step **10H2**.

NO : Go to step **10H9**.

10H2	CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

CHECK ***: Are the ABS sensor installation bolts tightened securely?***

YES : Go to step **10H3**.

NO : Tighten ABS sensor installation bolts securely.

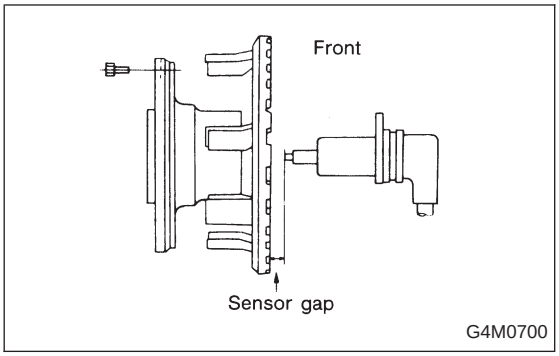
10H3	CHECK INSTALLATION OF TONE WHEEL.

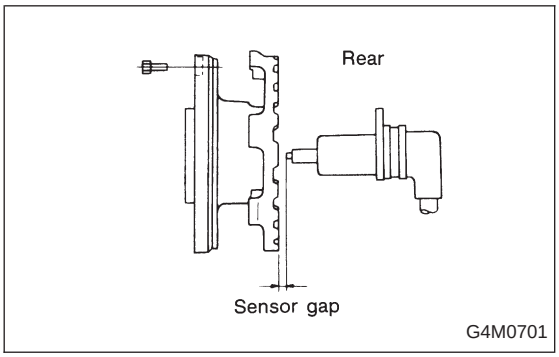
Tightening torque:
13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)

CHECK ***: Are the tone wheel installation bolts tightened securely?***

YES : Go to step **10H4**.

NO : Tighten tone wheel installation bolts securely.





10H4	CHECK ABS SENSOR GAP.

Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.

CHECK ***: Is the gap within the specifications shown in the following table?***

Specifications	Front wheel	Rear wheel
	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

YES : Go to step **10H5**.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

10H5	CHECK HUB RUNOUT.

Measure hub runout.

CHECK ***: Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **10H6**.

NO : Repair hub.

10H6	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK ***: Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10H7**.

10H7	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10H8**.

10H8	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

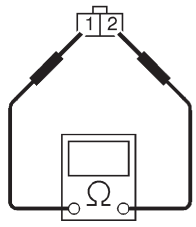
CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

NOTE:
Check harness and connectors between ABSCM&H/U and ABS sensor.

Except OUTBACK model



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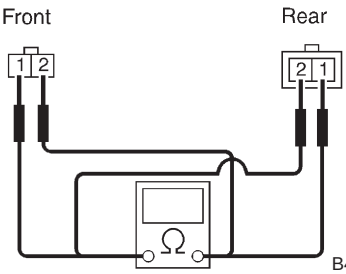
OUTBACK model



B4M1036C

10H9	CHECK ABS SENSOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABS sensor.
3) Measure resistance of ABS sensor connector terminals.

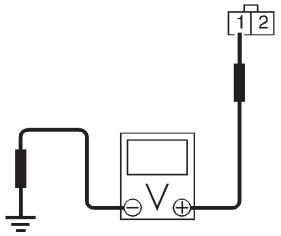
Terminal
Front RH No. 1 — No. 2:
Front LH No. 1 — No. 2:
Rear RH No. 1 — No. 2:
Rear LH No. 1 — No. 2:

CHECK ***: Is the resistance between 0.8 and 1.2 kΩ?***

YES : Go to step **10H10**.

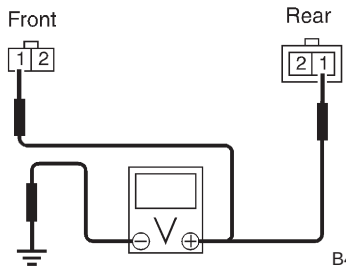
NO : Replace ABS sensor.

Except OUTBACK model



B4M0807E

OUTBACK model



B4M1037C

10H10	CHECK BATTERY SHORT OF ABS SENSOR.

1) Disconnect connector from ABSCM&H/U.
2) Measure voltage between ABS sensor and chassis ground.

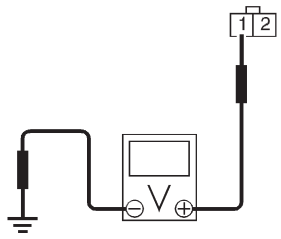
Terminal
Front RH No. 1 (+) — Chassis ground (−):
Front LH No. 1 (+) — Chassis ground (−):
Rear RH No. 1 (+) — Chassis ground (−):
Rear LH No. 1 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **10H11**.

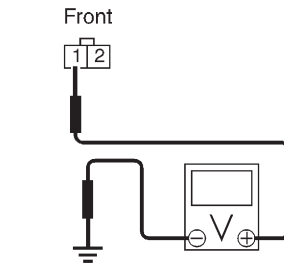
NO : Replace ABS sensor.

Except OUTBACK model



B4M0807E

OUTBACK model



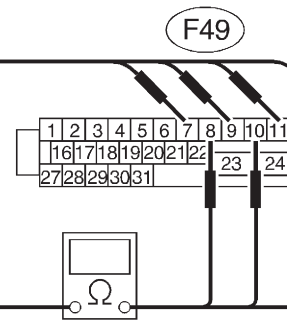
B4M1037C

10H11	CHECK BATTERY SHORT OF ABS SENSOR.

1) Turn ignition switch to ON.
2) Measure voltage between ABS sensor and chassis ground.

Terminal
Front RH No. 1 (+) — Chassis ground (−):
Front LH No. 1 (+) — Chassis ground (−):
Rear RH No. 1 (+) — Chassis ground (−):
Rear LH No. 1 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 1 V?***
YES : Go to step **10H12**.
NO : Replace ABS sensor.



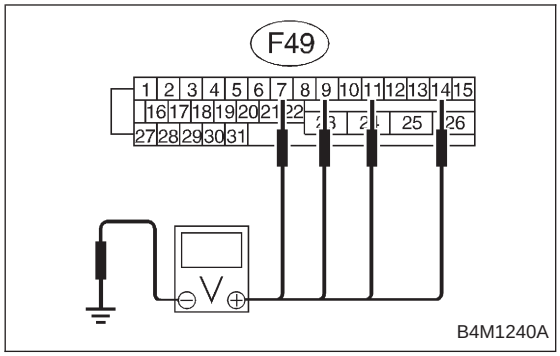
B4M1239A

10H12	CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR.

1) Turn ignition switch to OFF.
2) Connect connector to ABS sensor.
3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
Trouble code 21 / (F49) No. 11 — No. 12:
Trouble code 23 / (F49) No. 9 — No. 10:
Trouble code 25 / (F49) No. 14 — No. 15:
Trouble code 27 / (F49) No. 7 — No. 8:

CHECK ***: Is the resistance between 0.8 and 1.2 kΩ?***
YES : Go to step **10H13**.
NO : Repair harness/connector between ABSCM&H/U and ABS sensor.



10H13	CHECK BATTERY SHORT OF HARNESS.

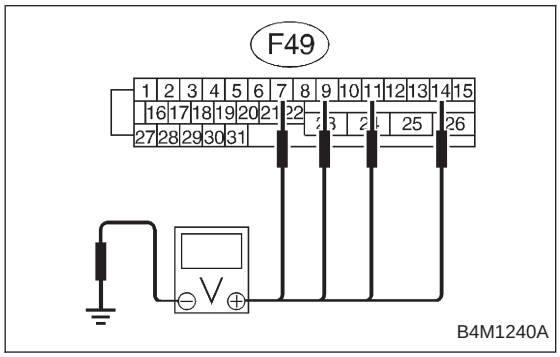
Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
Trouble code 21 / (F49) No. 11 (+) — Chassis ground (−):
Trouble code 23 / (F49) No. 9 (+) — Chassis ground (−):
Trouble code 25 / (F49) No. 14 (+) — Chassis ground (−):
Trouble code 27 / (F49) No. 7 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **10H14**.

NO : Repair harness between ABSCM&H/U and ABS sensor.



10H14	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
Trouble code 21 / (F49) No. 11 (+) — Chassis ground (−):
Trouble code 23 / (F49) No. 9 (+) — Chassis ground (−):
Trouble code 25 / (F49) No. 14 (+) — Chassis ground (−):
Trouble code 27 / (F49) No. 7 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **10H15**.

NO : Repair harness between ABSCM&H/U and ABS sensor.

10H15	CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

CHECK ***: Are the ABS sensor installation bolts tightened securely?***

YES : Go to step **10H16**.

NO : Tighten ABS sensor installation bolts securely.

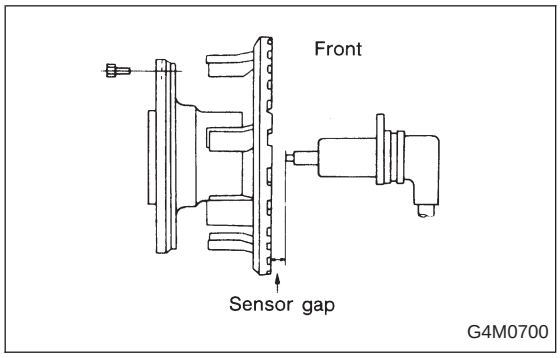
10H16	CHECK INSTALLATION OF TONE WHEEL.

Tightening torque:
13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)

CHECK ***: Are the tone wheel installation bolts tightened securely?***

YES : Go to step **10H17**.

NO : Tighten tone wheel installation bolts securely.

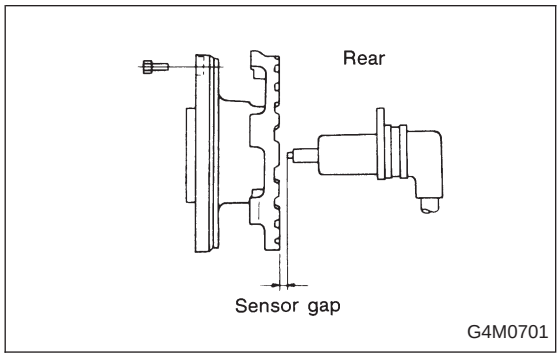


10H17	CHECK ABS SENSOR GAP.

Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.

CHECK ***: Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)



YES : Go to step **10H18**.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

10H18	CHECK HUB RUNOUT.

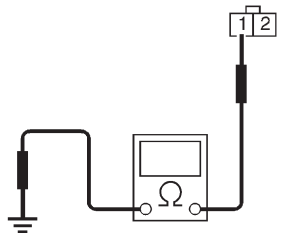
Measure hub runout.

CHECK ***: Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **10H19**.

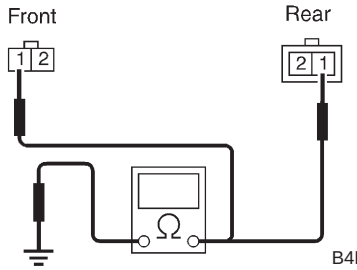
NO : Repair hub.

Except OUTBACK model

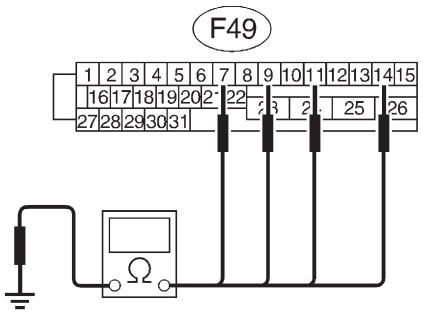


B4M0818E

OUTBACK model



B4M1042C



B4M1241A

10H19	CHECK GROUND SHORT OF ABS SENSOR.

1) Turn ignition switch to ON.
2) Measure resistance between ABS sensor and chassis ground.

Terminal
Front RH No. 1 — Chassis ground:
Front LH No. 1 — Chassis ground:
Rear RH No. 1 — Chassis ground:
Rear LH No. 1 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **10H20**.
NO : Replace ABS sensor and ABSCM&H/U.

10H20	CHECK GROUND SHORT OF HARNESS.

1) Turn ignition switch to OFF.
2) Connect connector to ABS sensor.
3) Measure resistance between ABSCM&H/U connector terminal and chassis ground.

Connector & terminal
Trouble code 21 / (F49) No. 11 — Chassis ground:
Trouble code 23 / (F49) No. 9 — Chassis ground:
Trouble code 25 / (F49) No. 14 — Chassis ground:
Trouble code 27 / (F49) No. 7 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **10H21**.
NO : Repair harness between ABSCM&H/U and ABS sensor.
And replace ABSCM&H/U.

10H21	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to FOREWORD [T3C1].>***
YES : Repair connector.
NO : Go to step **10H22**.

10H22	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10H23**.

10H23	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

NOTE:
Check harness and connectors between ABSCM&H/U and ABS sensor.

I: TROUBLE CODE 22 FR. SS SOFT — ABNORMAL FRONT RH ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —

J: TROUBLE CODE 24 FL. SS SOFT — ABNORMAL FRONT LH ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —

K: TROUBLE CODE 26 RR. SS SOFT — ABNORMAL REAR RH ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —

L: TROUBLE CODE 28 RL. SS SOFT — ABNORMAL REAR LH ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —

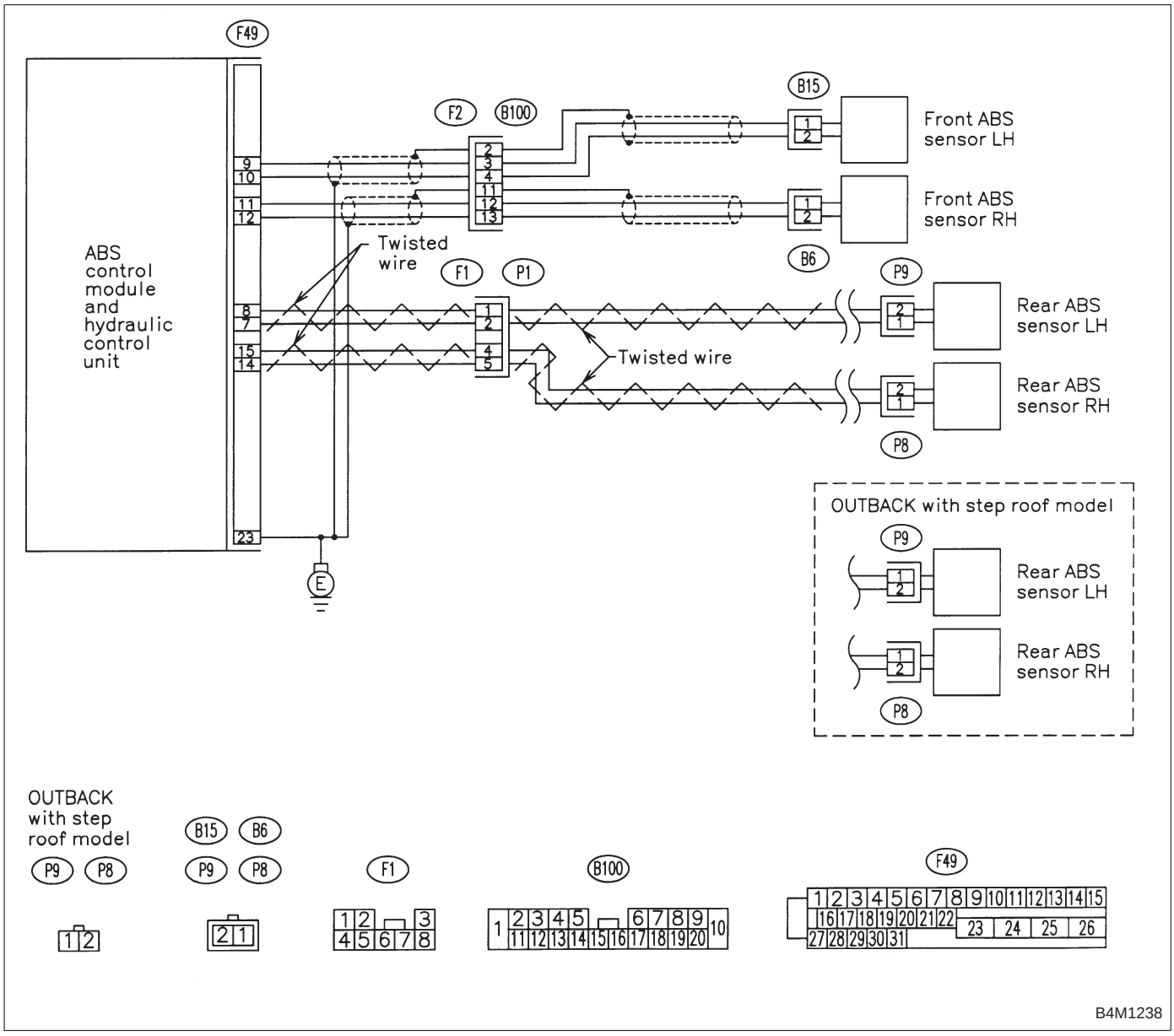
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector

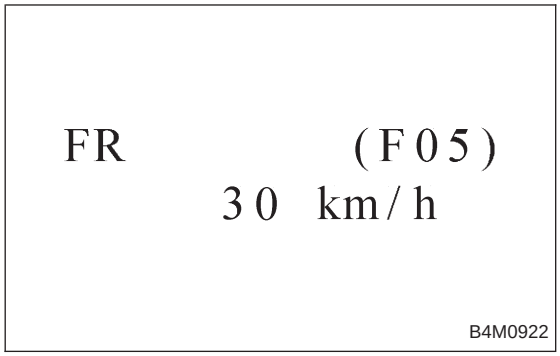
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1238



10L1	CHECK OUTPUT OF ABS SENSOR USING SELECT MONITOR.

Read the ABS sensor output corresponding to the faulty system in the select monitor function mode.

NOTE:
The select monitor display shows that the front right wheel is rotating at 30 km/h.

CHECK ***: Does the speed indicated on the display change in response to the speedometer reading during acceleration/deceleration when the steering wheel is in the straight-ahead position?***

YES : Go to step **10L2**.

NO : Go to step **10L8**.

10L2	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK ***: Is there poor contact in connectors between ABSCM&H/U and ABS sensor?***

YES : Repair connector.

NO : Go to step **10L3**.

10L3	CHECK SOURCES OF SIGNAL NOISE.

CHECK ***: Is the car telephone or the wireless transmitter properly installed?***

YES : Go to step **10L4**.

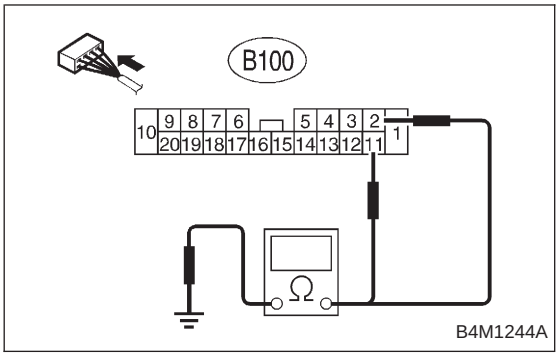
NO : Properly install the car telephone or the wireless transmitter.

10L4	CHECK SOURCES OF SIGNAL NOISE.

CHECK ***: Are noise sources (such as an antenna) installed near the sensor harness?***

YES : Install the noise sources apart from the sensor harness.

NO : Go to step **10L5**.



10L5	CHECK SHIELD CIRCUIT.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Measure resistance between shield connector and chassis ground.

Connector & terminal
Trouble code 22 / (B100) No. 11 — Chassis ground:
Trouble code 24 / (B100) No. 2 — Chassis ground:
Trouble code 26 / Go to step 10L6.
Trouble code 28 / Go to step 10L6.

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **10L6**.
NO : Repair shield harness.

10L6	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***
YES : Replace ABSCM&H/U.
NO : Go to step **10L7**.

10L7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***
YES : Proceed with the diagnosis corresponding to the trouble code.
NO : A temporary noise interference.

10L8	CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

CHECK ***: Are the ABS sensor installation bolts tightened securely?***
YES : Go to step **10L9**.
NO : Tighten ABS sensor installation bolts securely.

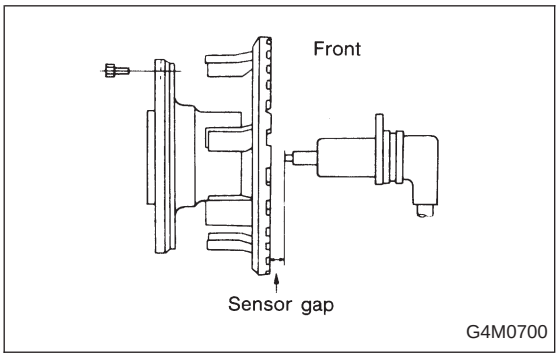
10L9	CHECK INSTALLATION OF TONE WHEEL.

Tightening torque:
13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)

CHECK ***: Are the tone wheel installation bolts tightened securely?***

YES : Go to step **10L10**.

NO : Tighten tone wheel installation bolts securely.

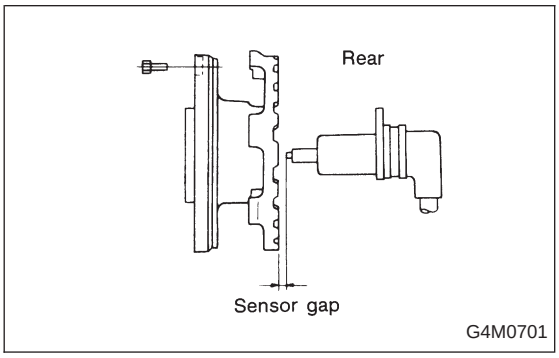


10L10	CHECK ABS SENSOR GAP.

Measure tone wheel to pole piece gap over entire perimeter of the wheel.

CHECK ***: Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)



YES : Go to step **10L11**.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

10L11	CHECK OSCILLOSCOPE.

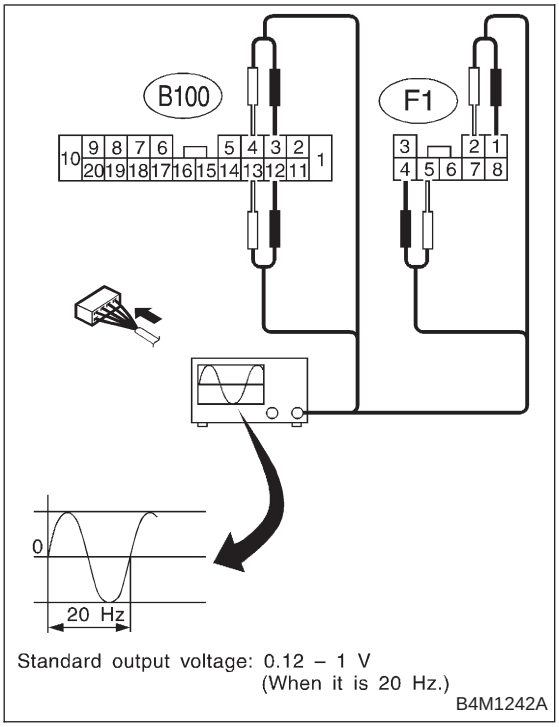
CHECK ***: Is an oscilloscope available?***

YES : Go to step **10L12**.

NO : Go to step **10L13**.

10L12	CHECK ABS SENSOR SIGNAL.

1) Raise all four wheels of ground.
2) Turn ignition switch OFF.
3) Connect the oscilloscope to the connector (F1) or connector (B100) in accordance with trouble code.
4) Turn ignition switch ON.



Standard output voltage: 0.12 – 1 V
(When it is 20 Hz.)
B4M1242A

5) Rotate wheels and measure voltage at specified frequency.

NOTE:
When this inspection is completed, the ABSCM&H/U sometimes stores the trouble code 29.

Connector & terminal
Trouble code 22 / (B100) No. 12 (+) — No. 13 (−):
Trouble code 24 / (B100) No. 3 (+) — No. 4 (−):
Trouble code 26 / (F1) No. 4 (+) — No. 5 (−):
Trouble code 28 / (F1) No. 1 (+) — No. 2 (−):
Specified voltage: 0.12 — 1 V (When it is 20 Hz.)

CHECK ***: Is oscilloscope pattern smooth, as shown in figure?***

YES : Go to step **10L16**.

NO : Go to step **10L13**.

10L13	CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.

Remove disc rotor or drum from hub in accordance with trouble code.

CHECK ***: Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?***

YES : Thoroughly remove dirt or other foreign matter.

NO : Go to step **10L14**.

10L14	CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.

CHECK ***: Are there broken or damaged in the ABS sensor pole piece or the tone wheel?***

YES : Replace ABS sensor or tone wheel.

NO : Go to step **10L15**.

10L15	CHECK HUB RUNOUT.

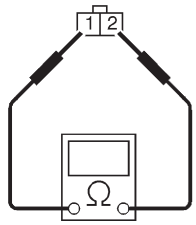
Measure hub runout.

CHECK ***: Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **10L16**.

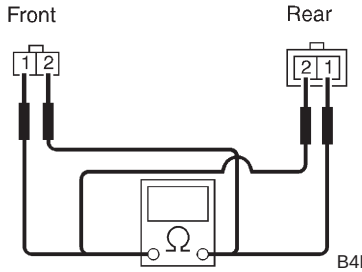
NO : Repair hub.

Except OUTBACK model



B4M0806E

OUTBACK model



B4M1036C

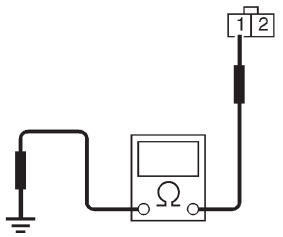
10L16	CHECK RESISTANCE OF ABS SENSOR.

1) Turn ignition switch OFF.
2) Disconnect connector from ABS sensor.
3) Measure resistance between ABS sensor connector terminals.

Terminal
Front RH No. 1 — No. 2:
Front LH No. 1 — No. 2:
Rear RH No. 1 — No. 2:
Rear LH No. 1 — No. 2:

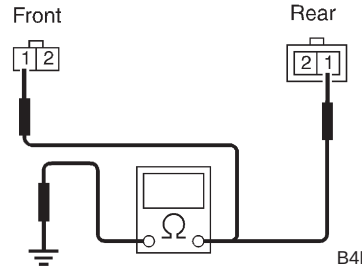
CHECK ***: Is the resistance between 0.8 and 1.2 kΩ?***
YES : Go to step **10L17**.
NO : Replace ABS sensor.

Except OUTBACK model



B4M0818E

OUTBACK model



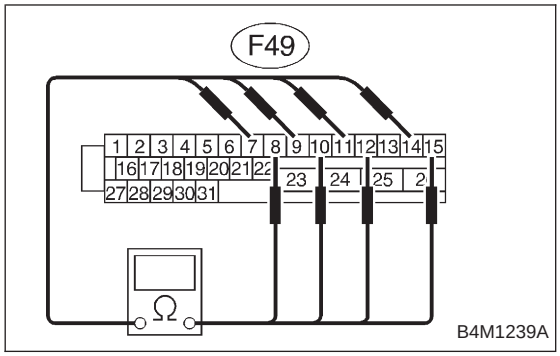
B4M1042C

10L17	CHECK GROUND SHORT OF ABS SENSOR.

Measure resistance between ABS sensor and chassis ground.

Terminal
Front RH No. 1 — Chassis ground:
Front LH No. 1 — Chassis ground:
Rear RH No. 1 — Chassis ground:
Rear LH No. 1 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **10L18**.
NO : Replace ABS sensor.

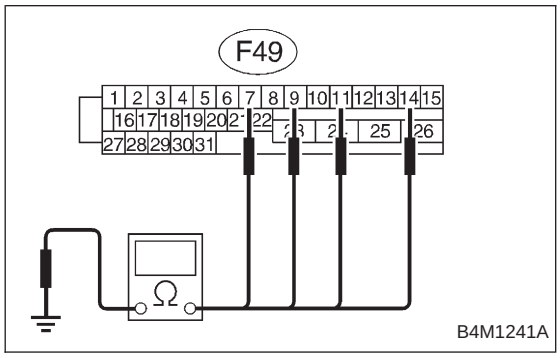


10L18	CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR.

1) Connect connector to ABS sensor.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance at ABSCM&H/U connector terminals.

Connector & terminal
Trouble code 22 / (F49) No. 11 — No. 12:
Trouble code 24 / (F49) No. 9 — No. 10:
Trouble code 26 / (F49) No. 14 — No. 15:
Trouble code 28 / (F49) No. 7 — No. 8:

CHECK ***: Is the resistance between 0.8 and 1.2 kΩ?***
YES : Go to step **10L19**.
NO : Repair harness/connector between ABSCM&H/U and ABS sensor.

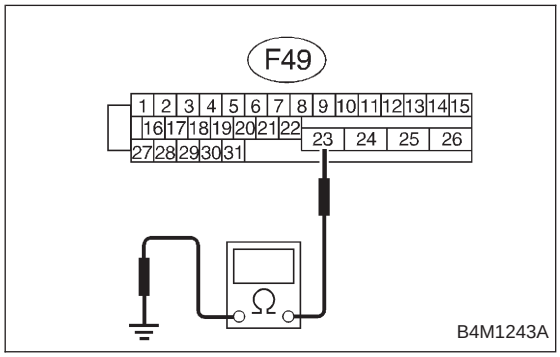


10L19	CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
Trouble code 22 / (F49) No. 11 — Chassis ground:
Trouble code 24 / (F49) No. 9 — Chassis ground:
Trouble code 26 / (F49) No. 14 — Chassis ground:
Trouble code 28 / (F49) No. 7 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **10L20**.
NO : Repair harness/connector between ABSCM&H/U and ABS sensor.



10L20	CHECK GROUND CIRCUIT OF ABSCM&H/U.

Measure resistance between ABSCM&H/U and chassis ground.

Connector & terminal
(F49) No. 23 — GND:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **10L21**.
NO : Repair ABSCM&H/U ground harness.

10L21	CHECK POOR CONTACT IN CONNECTORS.

CHECK : ***Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10L22**.

10L22	CHECK SOURCES OF SIGNAL NOISE.

CHECK : ***Is the car telephone or the wireless transmitter properly installed?***

YES : Go to step **10L23**.

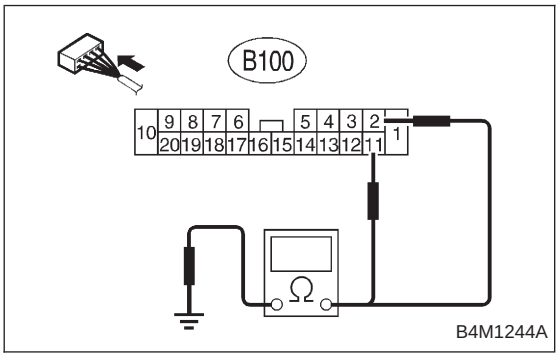
NO : Properly install the car telephone or the wireless transmitter.

10L23	CHECK SOURCES OF SIGNAL NOISE.

CHECK : ***Are noise sources (such as an antenna) installed near the sensor harness?***

YES : Install the noise sources apart from the sensor harness.

NO : Go to step **10L24**.



10L24	CHECK SHIELD CIRCUIT.

1) Connect all connectors.
2) Measure resistance between shield connector and chassis ground.

Connector & terminal
Trouble code 22 / (B100) No. 11 — Chassis ground:
Trouble code 24 / (B100) No. 2 — Chassis ground:
Trouble code 26 / Go to step 10L25.
Trouble code 28 / Go to step 10L25.

CHECK : ***Is the resistance less than 0.5 Ω?***

YES : Go to step **10L25**.

NO : Repair shield harness.

10L25	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10L26**.

10L26	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary noise interference.

D•NEW 29 (FB1)
EITHER. SS SOFT

B4M0952

M: TROUBLE CODE 29 EITHER. SS SOFT — ABNORMAL ABS SENSOR SIGNAL (ANY ONE OF FOUR) —

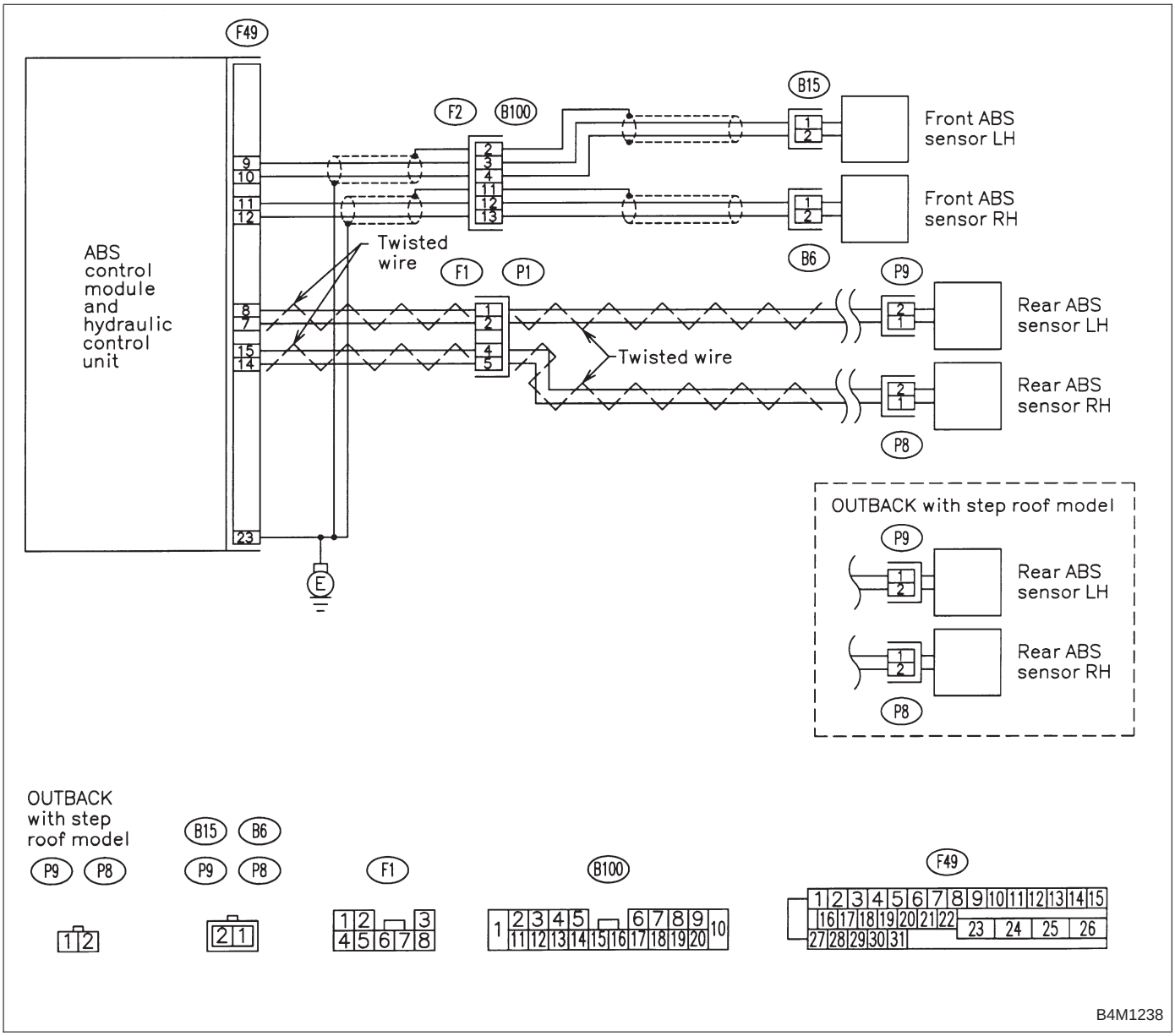
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty tone wheel
- Wheels turning freely for a long time

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1238

10M1	CHECK IF THE WHEELS HAVE TURNED FREELY FOR A LONG TIME.

CHECK : ***Check if the wheels have been turned freely for more than one minute, such as when the vehicle is jacked-up, under full-lock cornering or when tire is not in contact with road surface.***

YES : The ABS is normal. Erase the trouble code.

NOTE:
When the wheels turn freely for a long time, such as when the vehicle is towed or jacked-up, or when steering wheel is continuously turned all the way, this trouble code may sometimes occur.

NO : Go to step **10M2**.

10M2	CHECK TIRE SPECIFICATIONS.

Turn ignition switch to OFF.

CHECK ***: Are the tire specifications correct?***

YES : Go to step **10M3**.

NO : Replace tire.

10M3	CHECK WEAR OF TIRE.

CHECK ***: Is the tire worn excessively?***

YES : Replace tire.

NO : Go to step **10M4**.

10M4	CHECK TIRE PRESSURE.

CHECK ***: Is the tire pressure correct?***

YES : Go to step **10M5**.

NO : Adjust tire pressure.

10M5	CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:
32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

CHECK ***: Are the ABS sensor installation bolts tightened securely?***

YES : Go to step **10M6**.

NO : Tighten ABS sensor installation bolts securely.

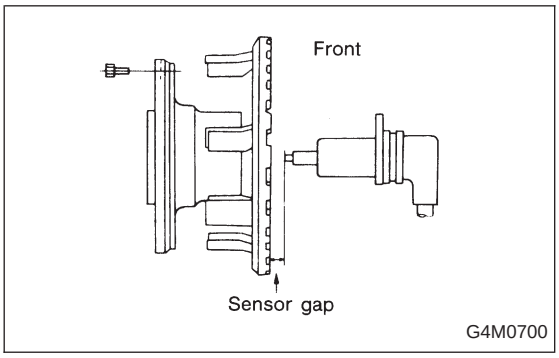
10M6	CHECK INSTALLATION OF TONE WHEEL.

Tightening torque:
13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)

CHECK ***: Are the tone wheel installation bolts tightened securely?***

YES : Go to step **10M7**.

NO : Tighten tone wheel installation bolts securely.

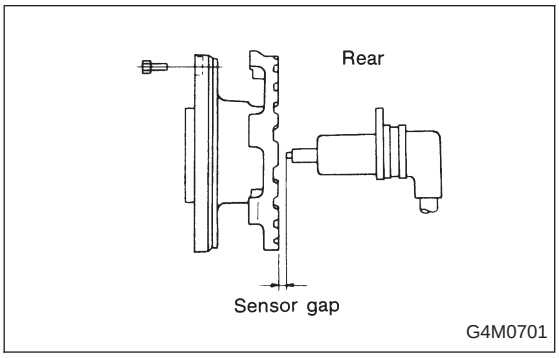


10M7	CHECK ABS SENSOR GAP.

Measure tone wheel to pole piece gap over entire perimeter of the wheel.

CHECK ***: Is the gap within the specifications shown in the following table?***

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)



YES : Go to step **10M8**.

NO : Adjust the gap.

NOTE:
Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

10M8	CHECK OSCILLOSCOPE.

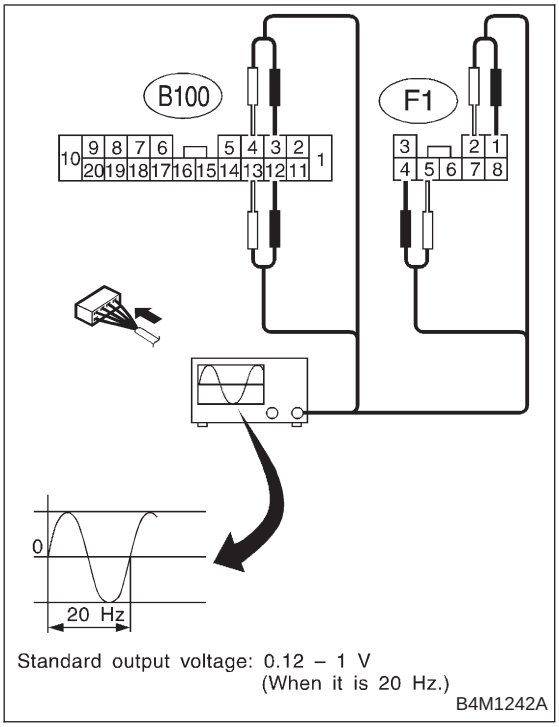
CHECK ***: Is an oscilloscope available?***

YES : Go to step **10M9**.

NO : Go to step **10M10**.

10M9	CHECK ABS SENSOR SIGNAL.

1) Raise all four wheels of ground.
2) Turn ignition switch OFF.
3) Connect the oscilloscope to the connector (F1) or connector (B100) in accordance with trouble code.
4) Turn ignition switch ON.



Standard output voltage: 0.12 – 1 V
(When it is 20 Hz.)
B4M1242A

5) Rotate wheels and measure voltage at specified frequency.

NOTE:
When this inspection is completed, the ABSCM&H/U sometimes stores the trouble code 29.

Connector & terminal
(B100) No. 12 (+) — No. 13 (−) (Front RH):
(B100) No. 3 (+) — No. 4 (−) (Front LH):
(F1) No. 4 (+) — No. 5 (−) (Rear RH):
(F1) No. 1 (+) — No. 2 (−) (Rear LH):
Specified voltage: 0.12 — 1 V (When it is 20 Hz.)

CHECK ***: Is oscilloscope pattern smooth, as shown in figure?***

YES : Go to step **8M13**.
NO : Go to step **8M10**.

10M10	CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.

Remove disc rotor from hub.

CHECK ***: Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?***

YES : Thoroughly remove dirt or other foreign matter.
NO : Go to step **10M11**.

10M11	CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.

CHECK ***: Are there broken or damaged teeth in the ABS sensor pole piece or the tone wheel?***

YES : Replace ABS sensor or tone wheel.
NO : Go to step **10M12**.

10M12	CHECK HUB RUNOUT.

Measure hub runout.

CHECK ***: Is the runout less than 0.05 mm (0.0020 in)?***

YES : Go to step **10M13**.
NO : Repair hub.

10M13	CHECK ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10M14**.

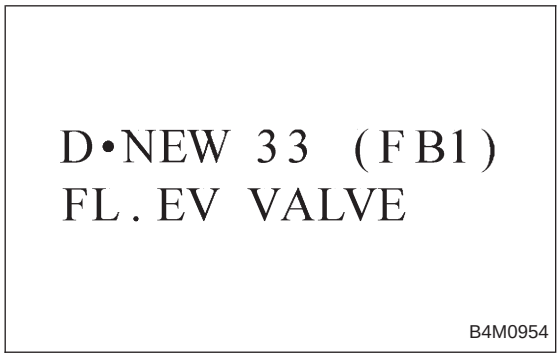
10M14	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

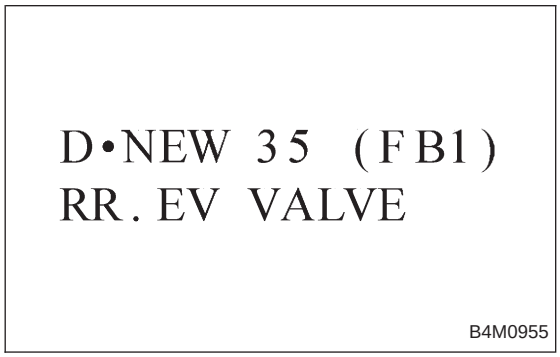
YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

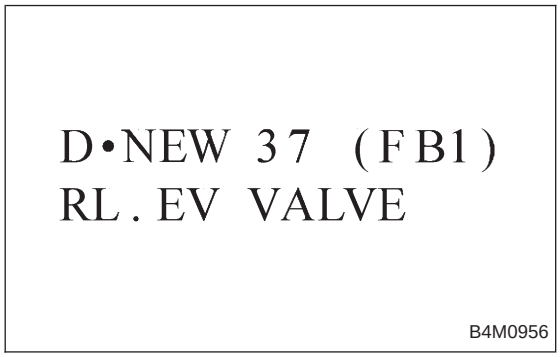
N: TROUBLE CODE 31 FR. EV VALVE — ABNORMAL FRONT RH INLET SOLENOID VALVE —



O: TROUBLE CODE 33 FL. EV VALVE — ABNORMAL FRONT LH INLET SOLENOID VALVE —



P: TROUBLE CODE 35 RR. EV VALVE — ABNORMAL REAR RH INLET SOLENOID VALVE —



Q: TROUBLE CODE 37 RL. EV VALVE — ABNORMAL REAR LH INLET SOLENOID VALVE —

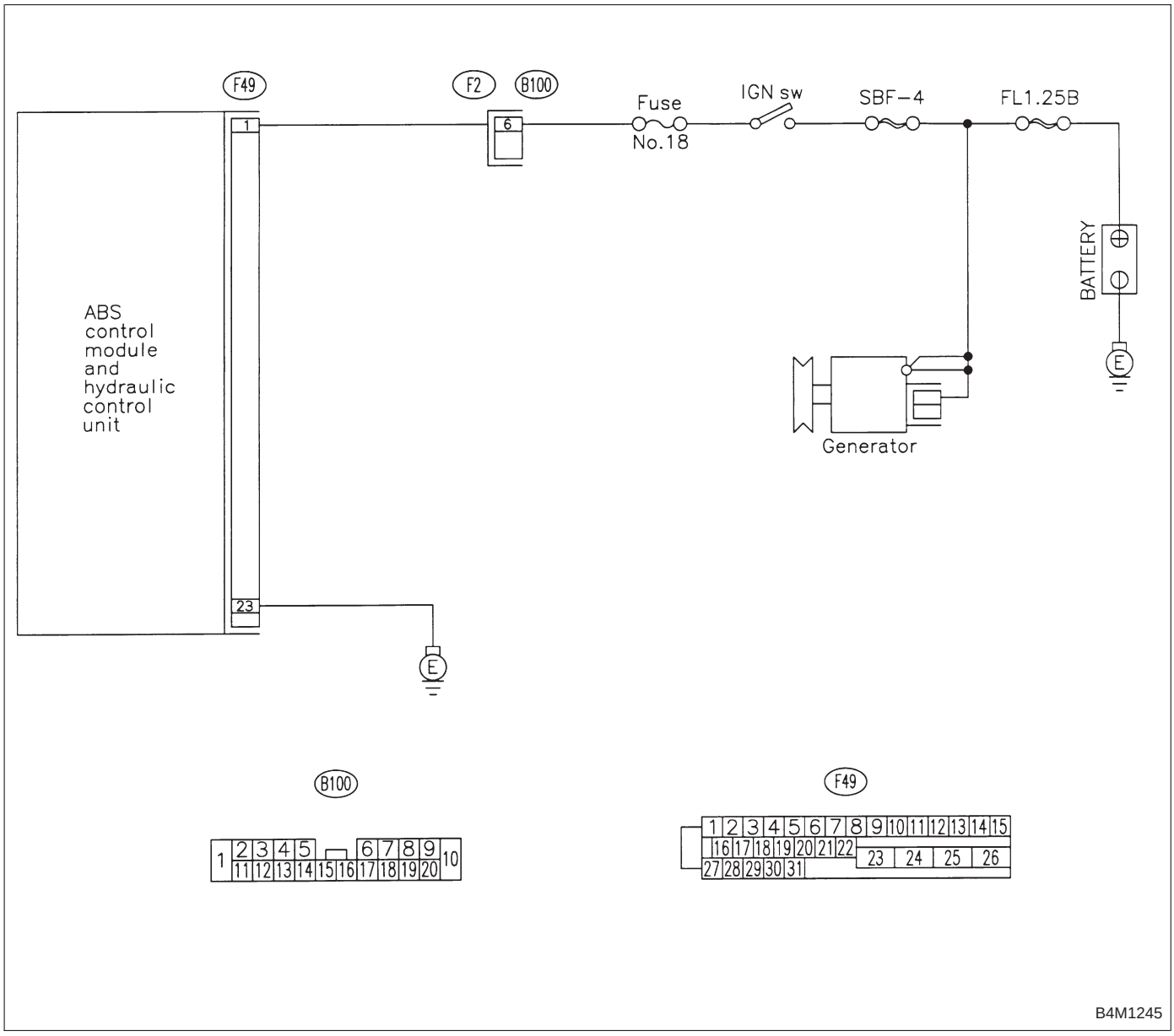
DIAGNOSIS:

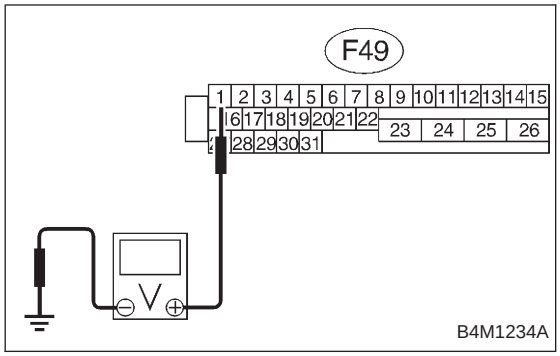
- Faulty harness/connector
- Faulty inlet solenoid valve

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10Q1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

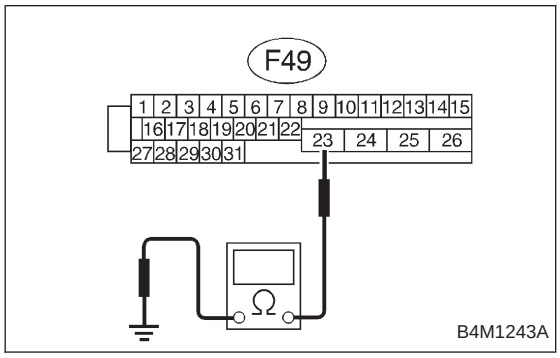
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Run the engine at idle.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **10Q2**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



10Q2	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **10Q3**.

NO : Repair ABSCM&H/U ground harness.

10Q3	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10Q4**.

10Q4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

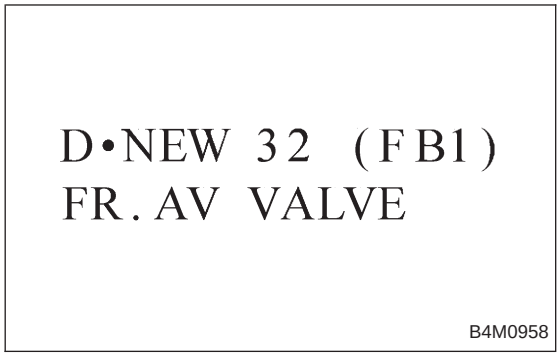
NO : Go to step **10Q5**.

10Q5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

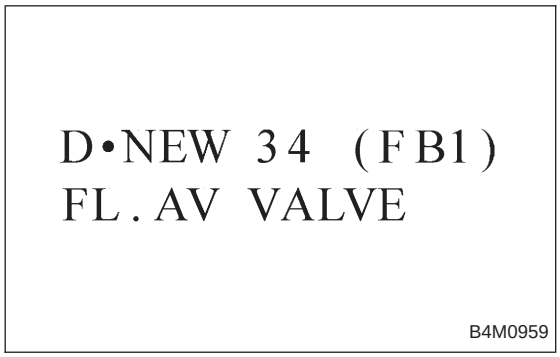
CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

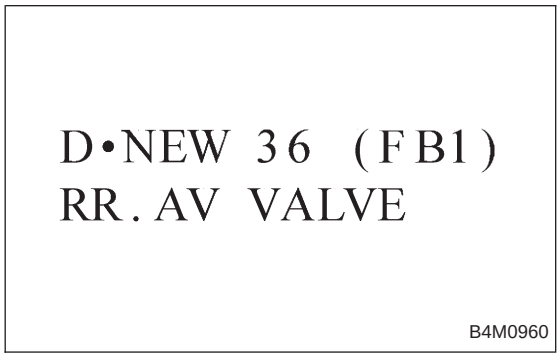
NO : A temporary poor contact.



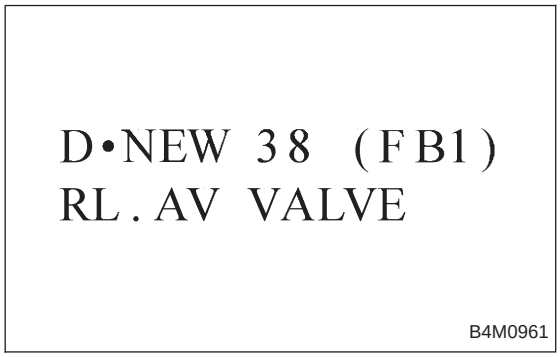
R: TROUBLE CODE 32 FR. AV VALVE — ABNORMAL FRONT RH OUTLET SOLENOID VALVE —



S: TROUBLE CODE 34 FL. AV VALVE — ABNORMAL FRONT LH OUTLET SOLENOID VALVE —



T: TROUBLE CODE 36 RR. AV VALVE — ABNORMAL REAR RH OUTLET SOLENOID VALVE —



U: TROUBLE CODE 38 RL. AV VALVE — ABNORMAL REAR LH OUTLET SOLENOID VALVE —

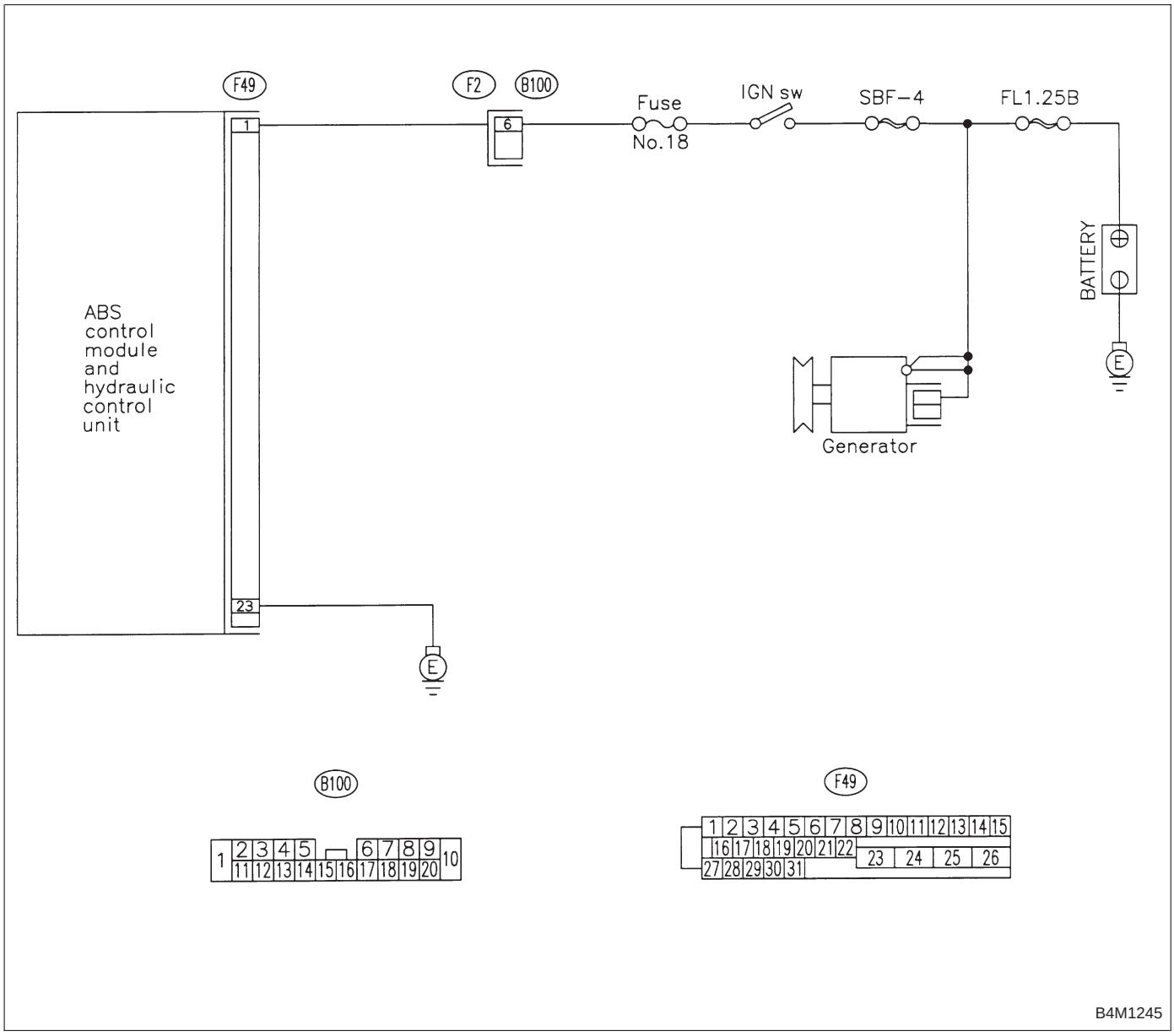
DIAGNOSIS:

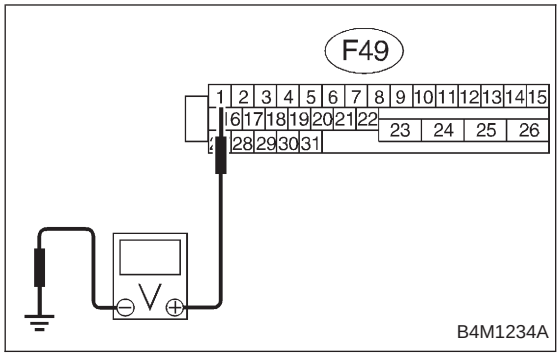
- Faulty harness/connector
- Faulty outlet solenoid valve

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10U1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

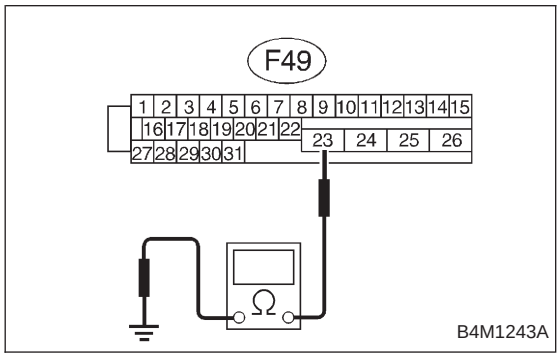
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Run the engine at idle.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **10U2**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



10U2	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **10U3**.

NO : Repair ABSCM&H/U ground harness.

10U3	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10U4**.

10U4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

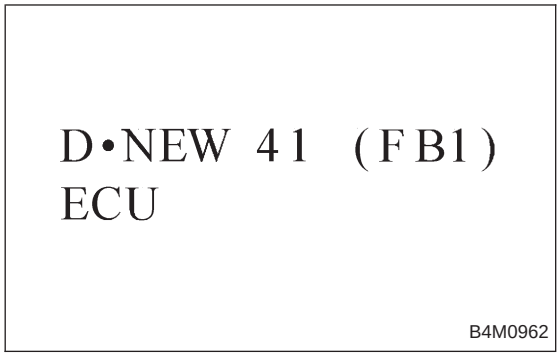
NO : Go to step **10U5**.

10U5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



V: TROUBLE CODE 41 ECU — ABNORMAL ABS CONTROL MODULE —

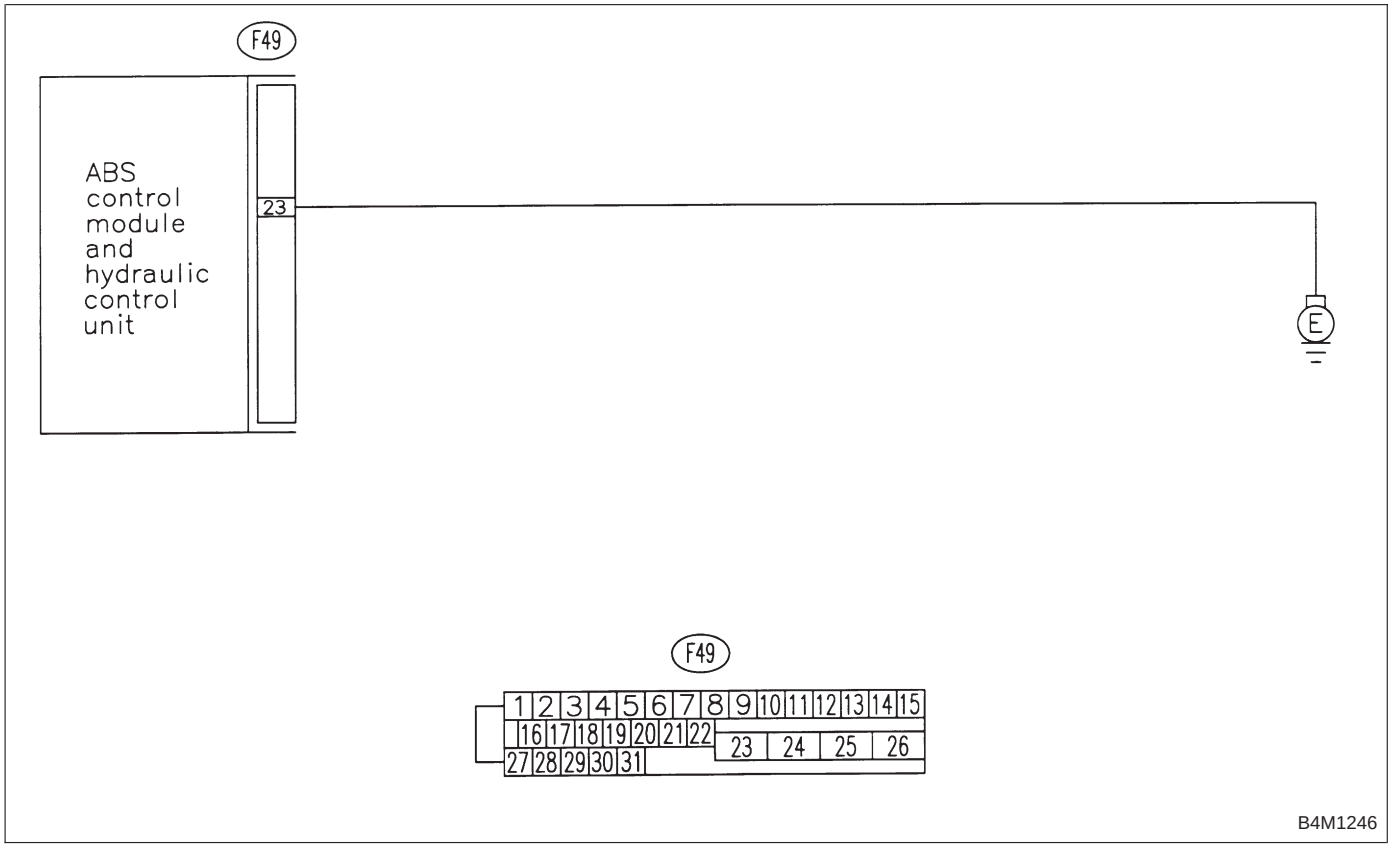
DIAGNOSIS:

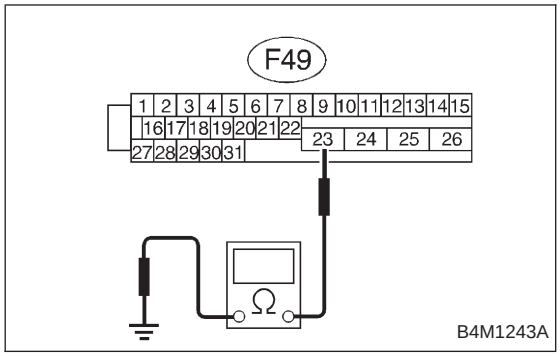
- Faulty ABSCM&H/U

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10V1	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance between ABSCM&H/U and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **10V2**.
NO : Repair ABSCM&H/U ground harness.

10V2	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between battery, ignition switch and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***
YES : Repair connector.
NO : Go to step **10V3**.

10V3	CHECK SOURCES OF SIGNAL NOISE.

CHECK ***: Is the car telephone or the wireless transmitter properly installed?***
YES : Go to step **10V4**.
NO : Properly install the car telephone or the wireless transmitter.

10V4	CHECK SOURCES OF SIGNAL NOISE.

CHECK ***: Are noise sources (such as an antenna) installed near the sensor harness?***
YES : Install the noise sources apart from the sensor harness.
NO : Go to step **10V5**.

10V5	CHECK ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***
YES : Replace ABSCM&H/U.
NO : Go to step **10V6**.

10V6	**CHECK ANY OTHER TROUBLE CODES APPEARANCE.**

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 42 (FB1)
LOW VOLTAGE

B4M0963

W: TROUBLE CODE 42 LOW VOLTAGE — SOURCE VOLTAGE IS LOW —

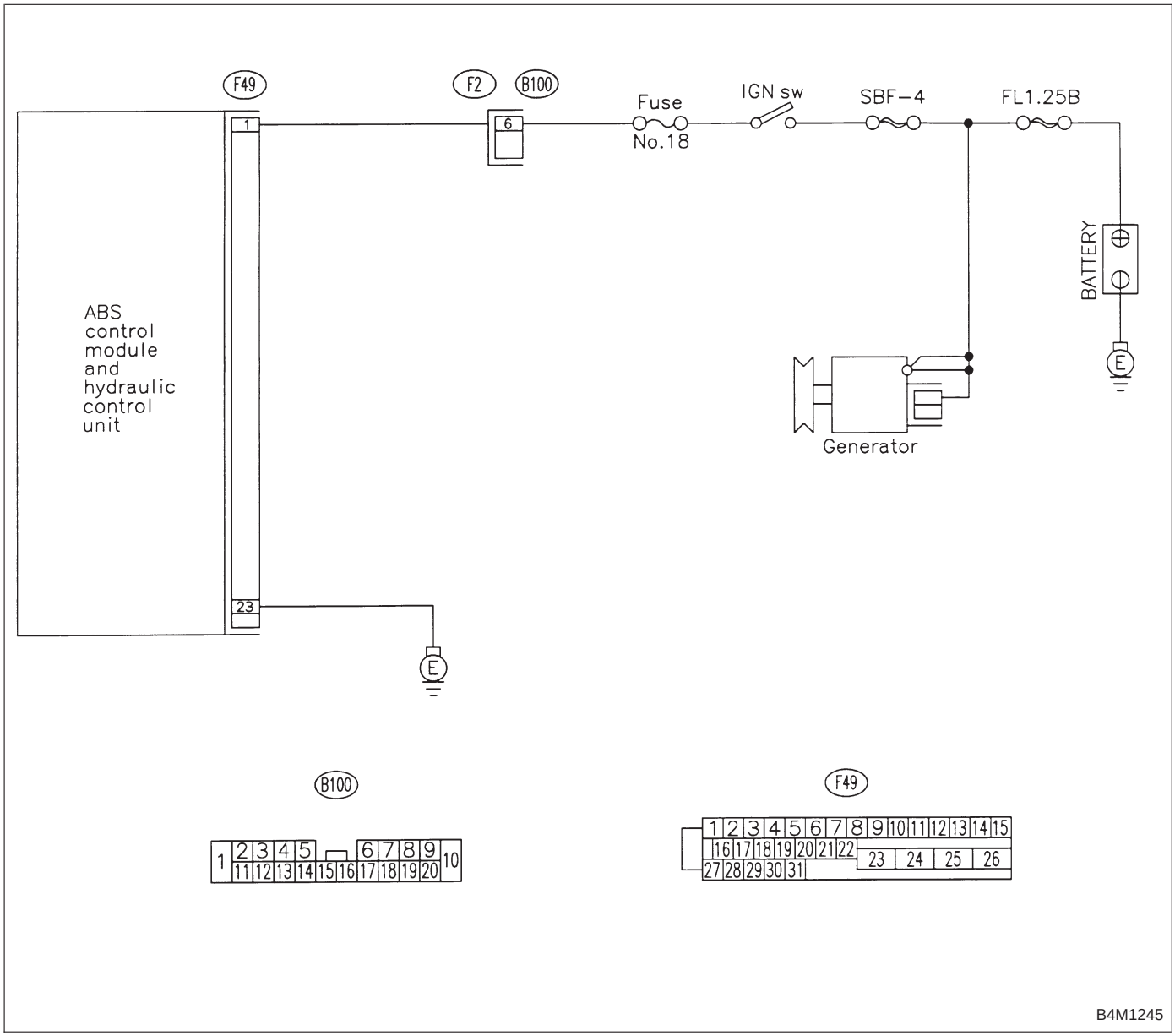
DIAGNOSIS:

- Power source voltage of the ABSCM&H/U is low.

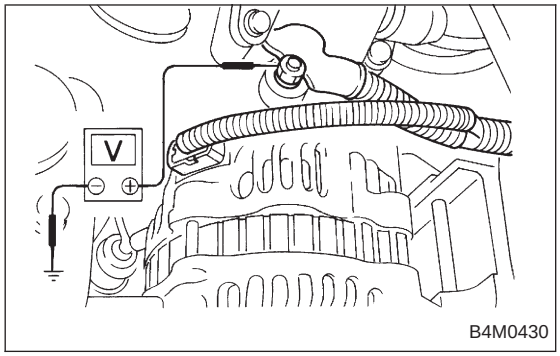
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1245



10W1	CHECK GENERATOR.

1) Start engine.
2) Idling after warm-up.
3) Measure voltage between generator B terminal and chassis ground.

Terminal
Generator B terminal — Chassis ground:

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **10W2**.

NO : Repair generator.

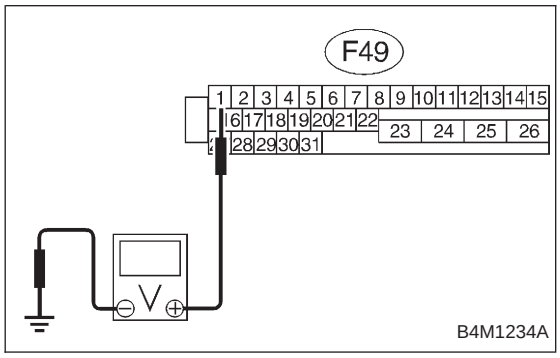
10W2	CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

CHECK ***: Are the positive and negative battery terminals tightly clamped?***

YES : Go to step **10W3**.

NO : Tighten the clamp of terminal.



10W3	CHECK INPUT VOLTAGE OF ABSCM&H/U.

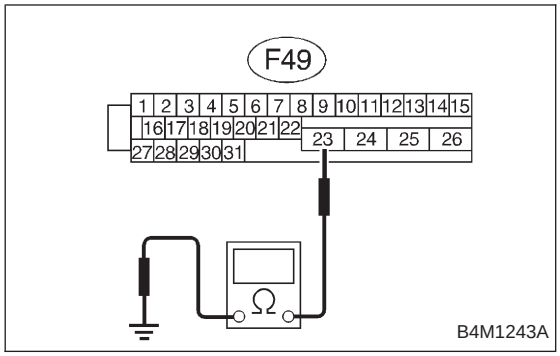
1) Disconnect connector from ABSCM&H/U.
2) Run the engine at idle.
3) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **10W4**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



10W4	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **10W5**.
NO : Repair ABSCM&H/U ground harness.

10W5	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***
YES : Repair connector.
NO : Go to step **10W6**.

10W6	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***
YES : Replace ABSCM&H/U.
NO : Go to step **10W7**.

10W7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***
YES : Proceed with the diagnosis corresponding to the trouble code.
NO : A temporary poor contact.

D·NEW 42 (FB1)
HIGH VOLTAGE

B4M1268

X: TROUBLE CODE 42 LOW VOLTAGE — SOURCE VOLTAGE IS HIGH —

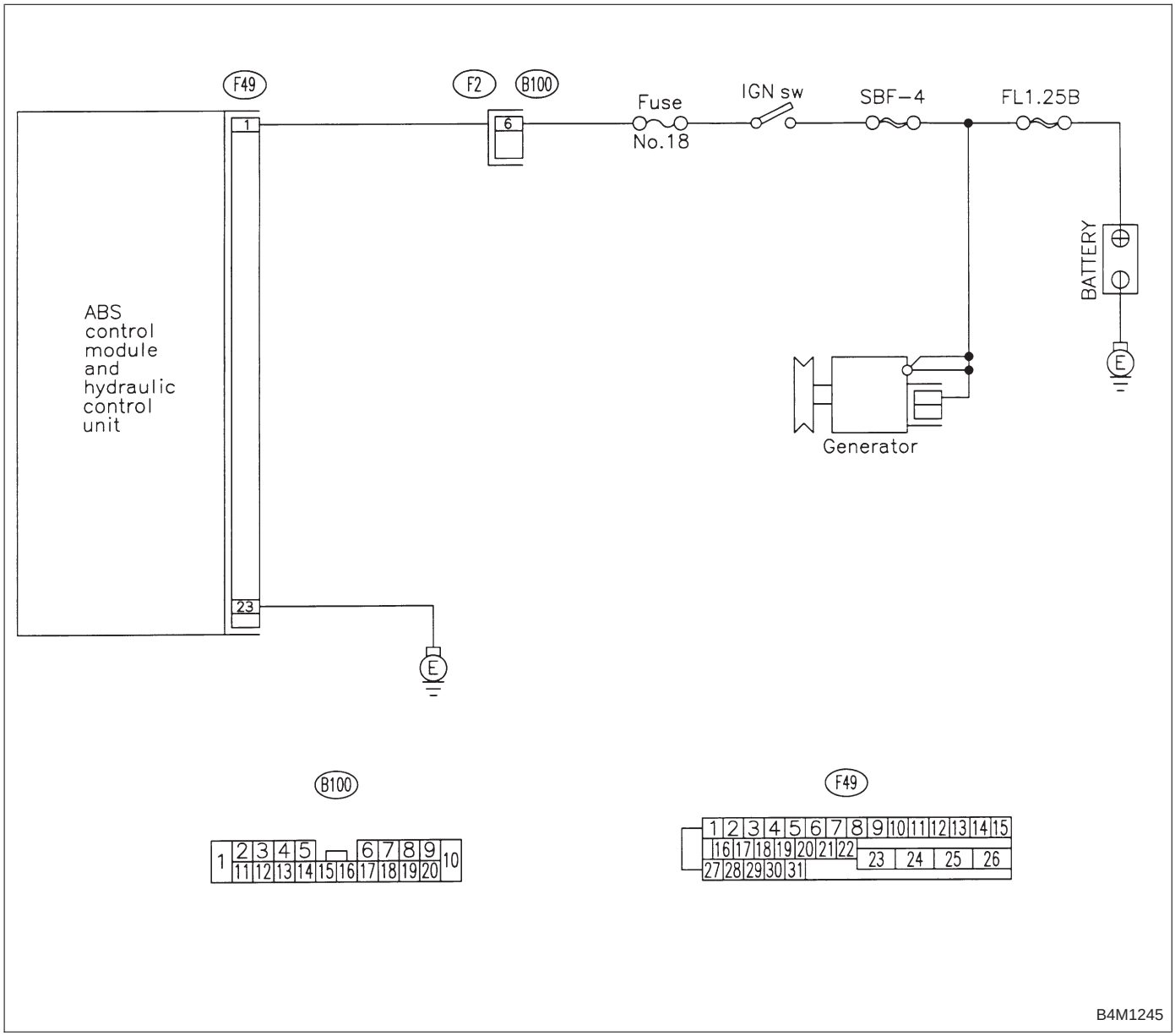
DIAGNOSIS:

- Power source voltage of the ABSCM&H/U is high.

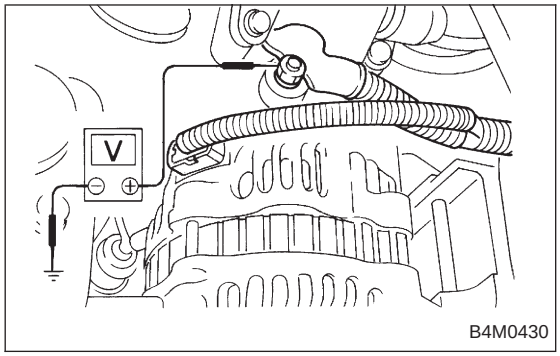
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1245



10X1	CHECK GENERATOR.

1) Start engine.
2) Idling after warm-up.
3) Measure voltage between generator B terminal and chassis ground.

Terminal
Generator B terminal — Chassis ground:

CHECK ***: Is the voltage between 10 V and 17 V?***

YES : Go to step **10X2**.

NO : Repair generator.

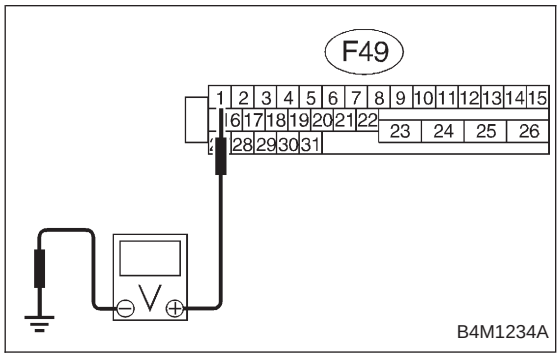
10X2	CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

CHECK ***: Are the positive and negative battery terminals tightly clamped?***

YES : Go to step **10X3**.

NO : Tighten the clamp of terminal.



10X3	CHECK INPUT VOLTAGE OF ABSCM&H/U.

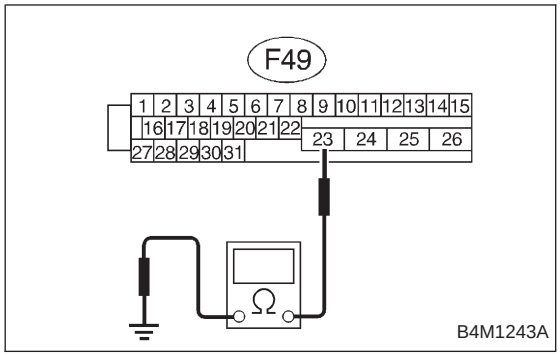
1) Disconnect connector from ABSCM&H/U.
2) Run the engine at idle.
3) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 17 V?***

YES : Go to step **10X4**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



10X4	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***
YES : Go to step **10X5**.
NO : Repair ABSCM&H/U ground harness.

10X5	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***
YES : Repair connector.
NO : Go to step **10X6**.

10X6	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***
YES : Replace ABSCM&H/U.
NO : Go to step **10X7**.

10X7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***
YES : Proceed with the diagnosis corresponding to the trouble code.
NO : A temporary poor contact.

D•NEW 44 (FB1)
CCM LINE

B4M0964

Y: TROUBLE CODE 44 CCM LINE — A COMBINATION OF AT CONTROL ABNORMALS —

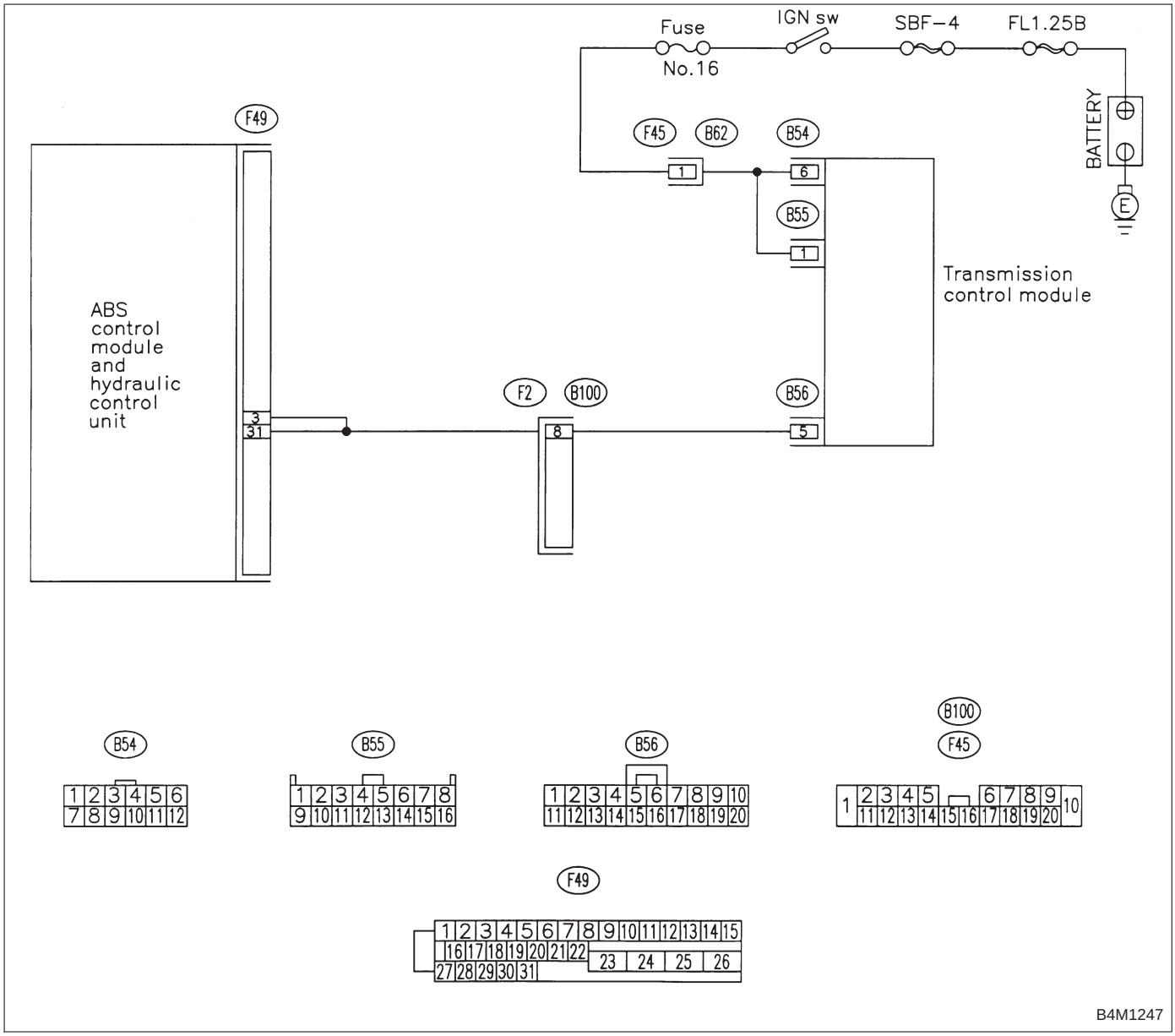
DIAGNOSIS:

- Combination of AT control faults

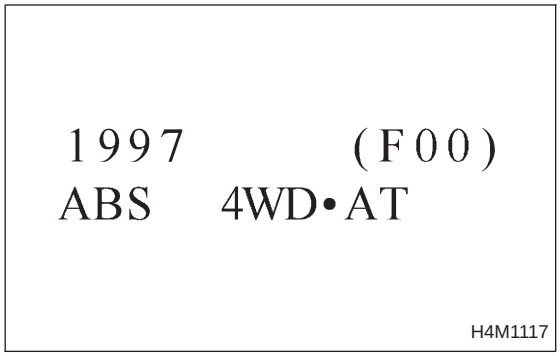
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1247



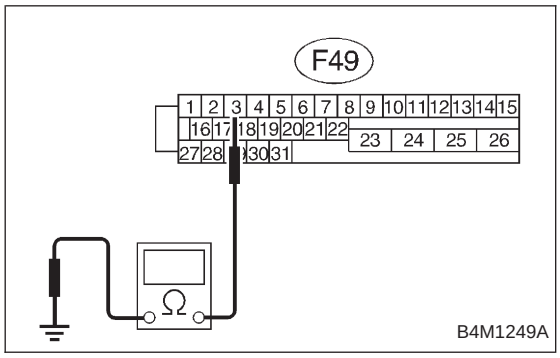
10Y1	CHECK SPECIFICATIONS OF ABSCM&H/U USING SELECT MONITOR.

1) Press [F], [0] and [0] on the select monitor.
2) Read the select monitor display.

CHECK ***: Is an ABSCM&H/U for AT model installed on a MT model?***

YES : Replace ABSCM&H/U.

NO : Go to step **10Y2**.



10Y2	CHECK GROUND SHORT OF HARNESS.

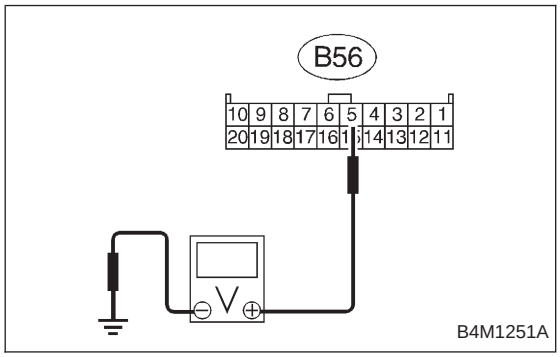
1) Turn ignition switch to OFF.
2) Disconnect two connectors from TCM.
3) Disconnect connector from ABSCM&H/U.
4) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **10Y3**.

NO : Repair harness between TCM and ABSCM&H/U.



10Y3	CHECK TCM.

1) Connect all connectors to TCM.
2) Turn ignition switch to ON.
3) Measure voltage between TCM connector terminal and chassis ground.

Connector & terminal
(B55) No. 5 (+) — Chassis ground (−):

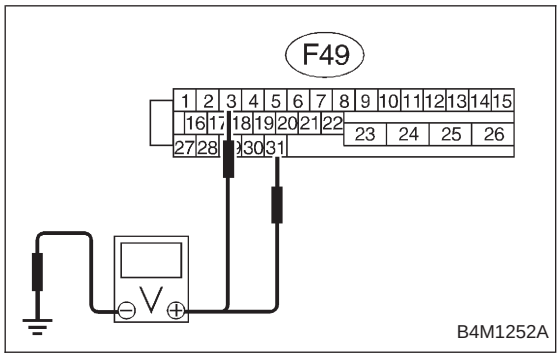
CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **10Y5**.

NO : Go to step **10Y4**.

10Y4	CHECK AT.

CHECK : ***Is the AT functioning normally?***
YES : Replace TCM.
NO : Repair AT.



10Y5	CHECK OPEN CIRCUIT OF HARNESS.

Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (−):
(F49) No. 31 (+) — Chassis ground (−):

CHECK : ***Is the voltage more than 10 V?***
YES : Go to step **10Y6**.
NO : Repair harness/connector between AT control module and ABSCM&H/U.

10Y6	CHECK POOR CONTACT IN CONNECTORS.

CHECK : ***Is there poor contact in connectors between AT control module and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***
YES : Repair connector.
NO : Go to step **10Y7**.

10Y7	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***
YES : Replace ABSCM&H/U.
NO : Go to step **10Y8**.

10Y8	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***
YES : Proceed with the diagnosis corresponding to the trouble code.
NO : A temporary poor contact.

D•NEW 44 (FB1)
CCM OPEN

B4M0965

Z: TROUBLE CODE 44 CCM OPEN — A COMBINATION OF AT CONTROL ABNORMALS —

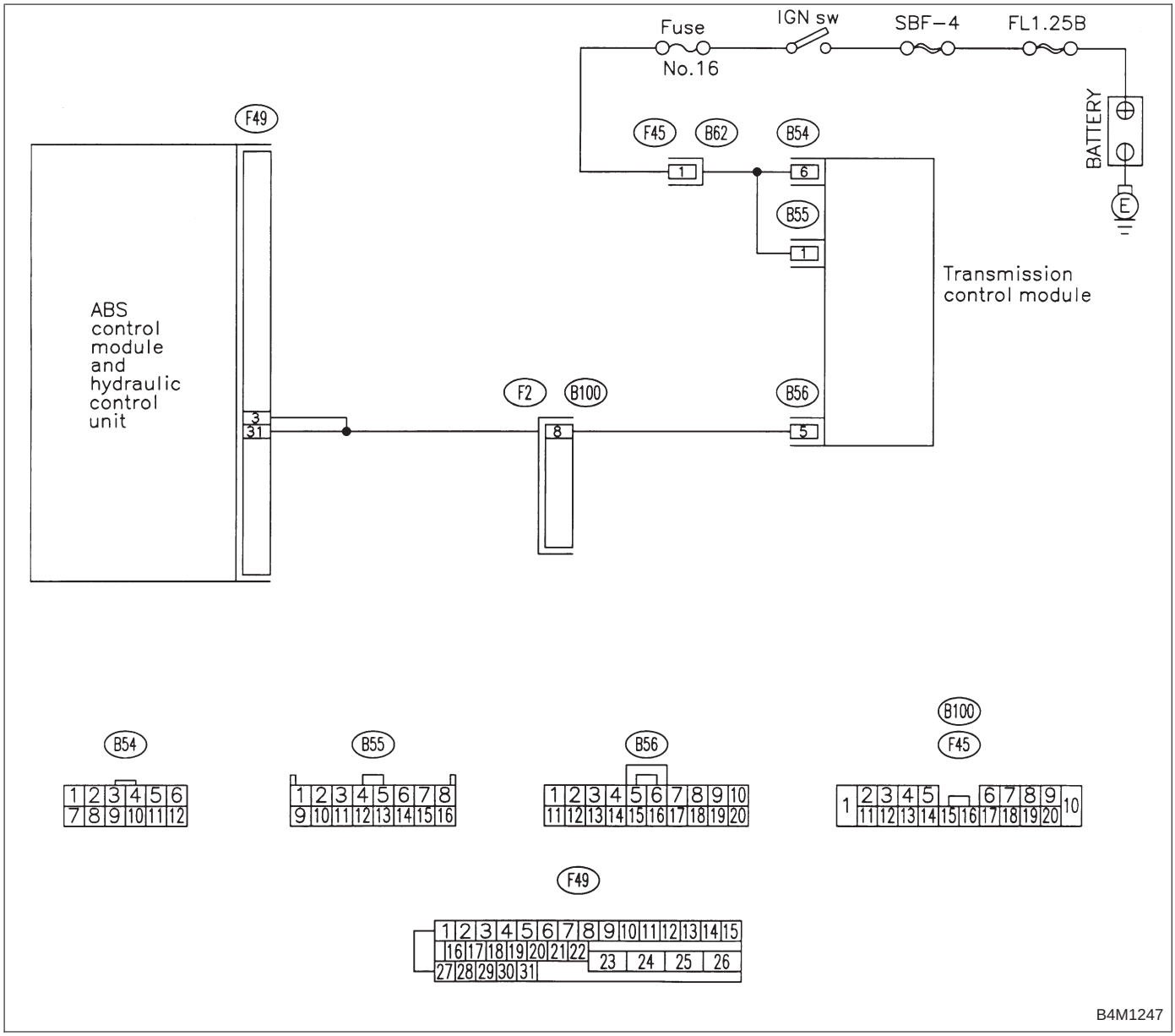
DIAGNOSIS:

- Combination of AT control faults

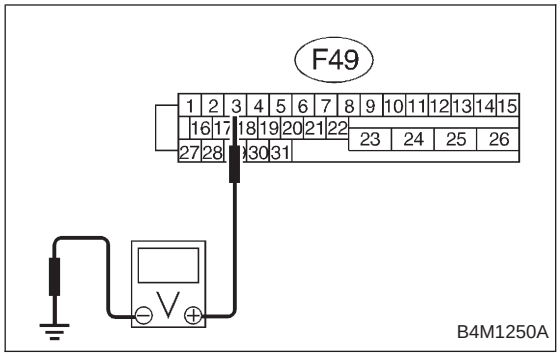
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1247



10Z1	CHECK BATTERY SHORT OF HARNESS.

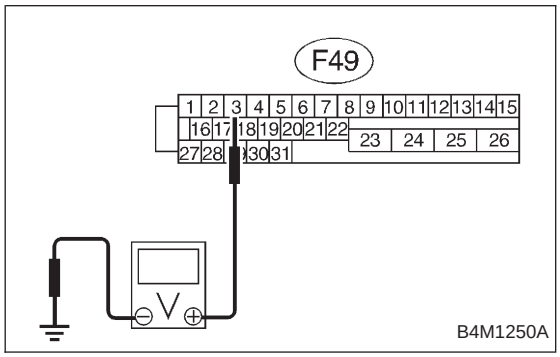
1) Turn ignition switch to OFF.
2) Disconnect two connectors from AT control module.
3) Disconnect connector from ABSCM&H/U.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **10Z2**.

NO : Repair harness between AT control module and ABSCM&H/U.



10Z2	CHECK BATTERY SHORT OF HARNESS.

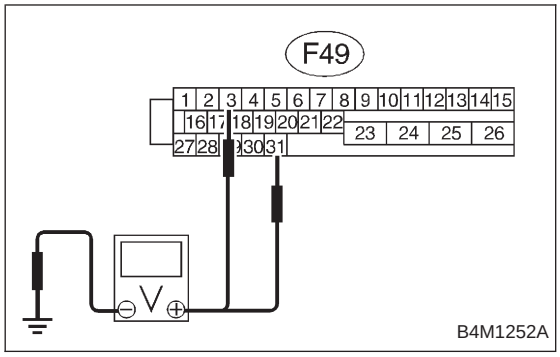
1) Turn ignition switch to ON.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **10Z3**.

NO : Repair harness between AT control module and ABSCM&H/U.



10Z3	CHECK OPEN CIRCUIT OF HARNESS.

1) Turn ignition switch to OFF.
2) Connect all connectors to TCM.
3) Turn ignition switch to ON.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (−):
(F49) No. 31 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 13 V?***

YES : Go to step **10Z4**.

NO : Repair harness/connector between TCM and ABSCM&H/U.

10Z4	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK ***: Is there poor contact in connectors between AT control module and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10Z5**.

10Z5	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10Z6**.

10Z6	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 51 (FB1)
V. RELAY

B4M0968

AA: TROUBLE CODE 51 V. RELAY — ABNORMAL VALVE RELAY —

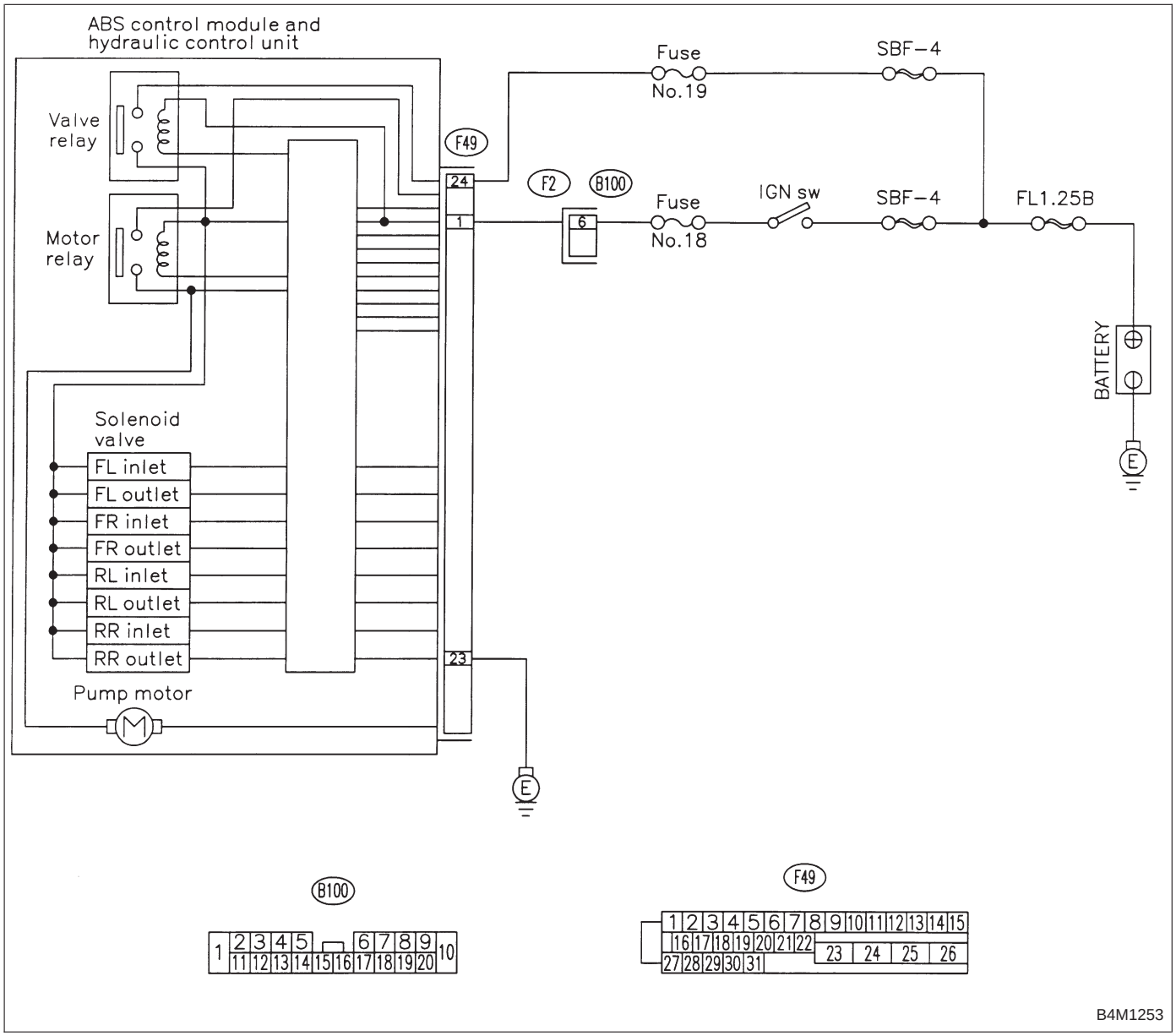
DIAGNOSIS:

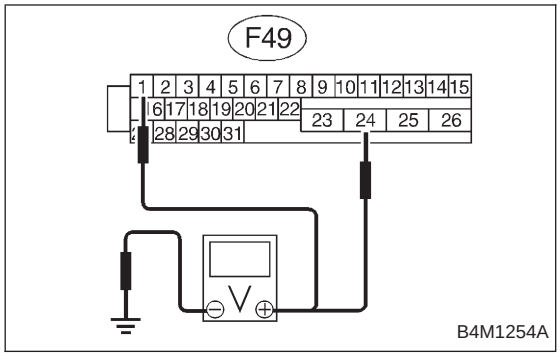
- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10AA1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

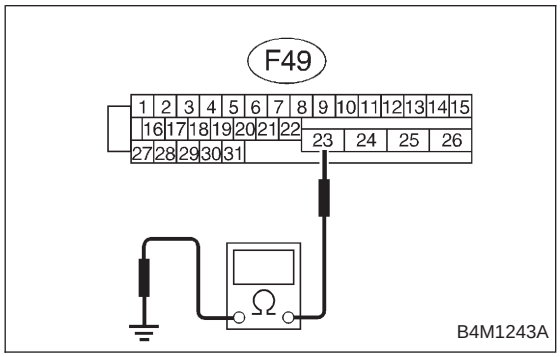
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Run the engine at idle.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (−):
(F49) No. 24 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **10AA2**.

NO : Repair harness connector between battery and ABSCM&H/U.



10AA2	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **10AA3**.

NO : Repair ABSCM&H/U ground harness.

10AA3	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10AA4**.

10AA4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AA5**.

10AA5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 51 (FB1)
V.RELAY ON

B4M0802

AB: TROUBLE CODE 51 V. RELAY ON — VALVE RELAY ON FAILURE —

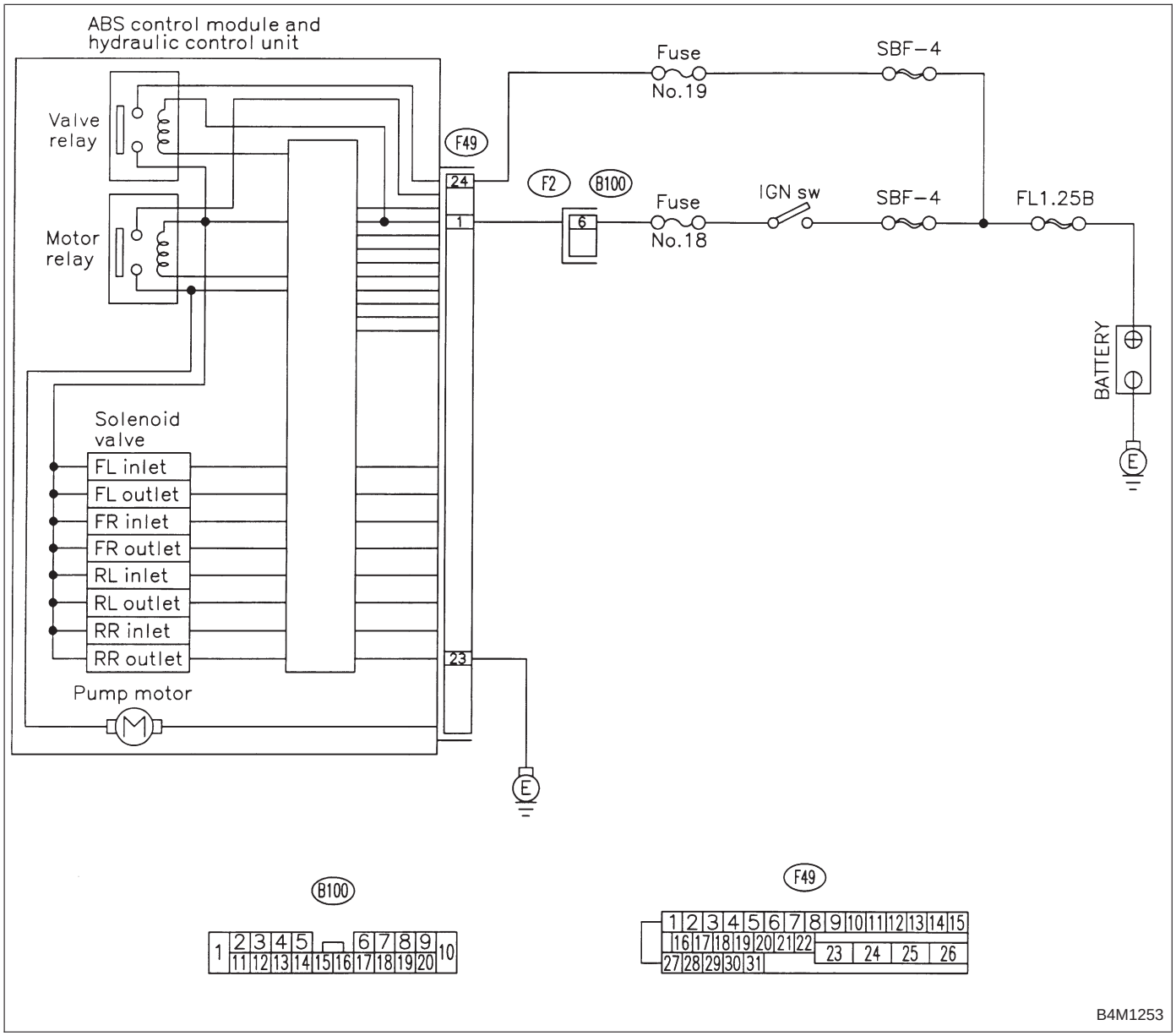
DIAGNOSIS:

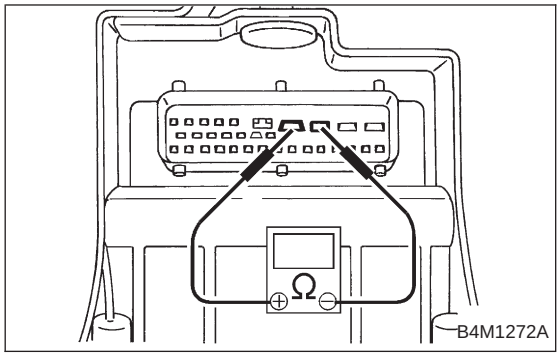
- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10AB1	CHECK VALVE RELAY IN ABSCM&H/U.

Measure resistance between ABSCM&H/U terminals.

Terminals
No. 23 (+) — No. 24 (−):

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **10AB2**.

NO : Replace ABSCM&H/U.

10AB2	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10AB3**.

10AB3	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AB4**.

10AB4	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 52 (FB1)
M. RELAY OPEN

B4M0969

AC: TROUBLE CODE 52 M. RELAY OPEN — OPEN CIRCUIT OF MOTOR RELAY —

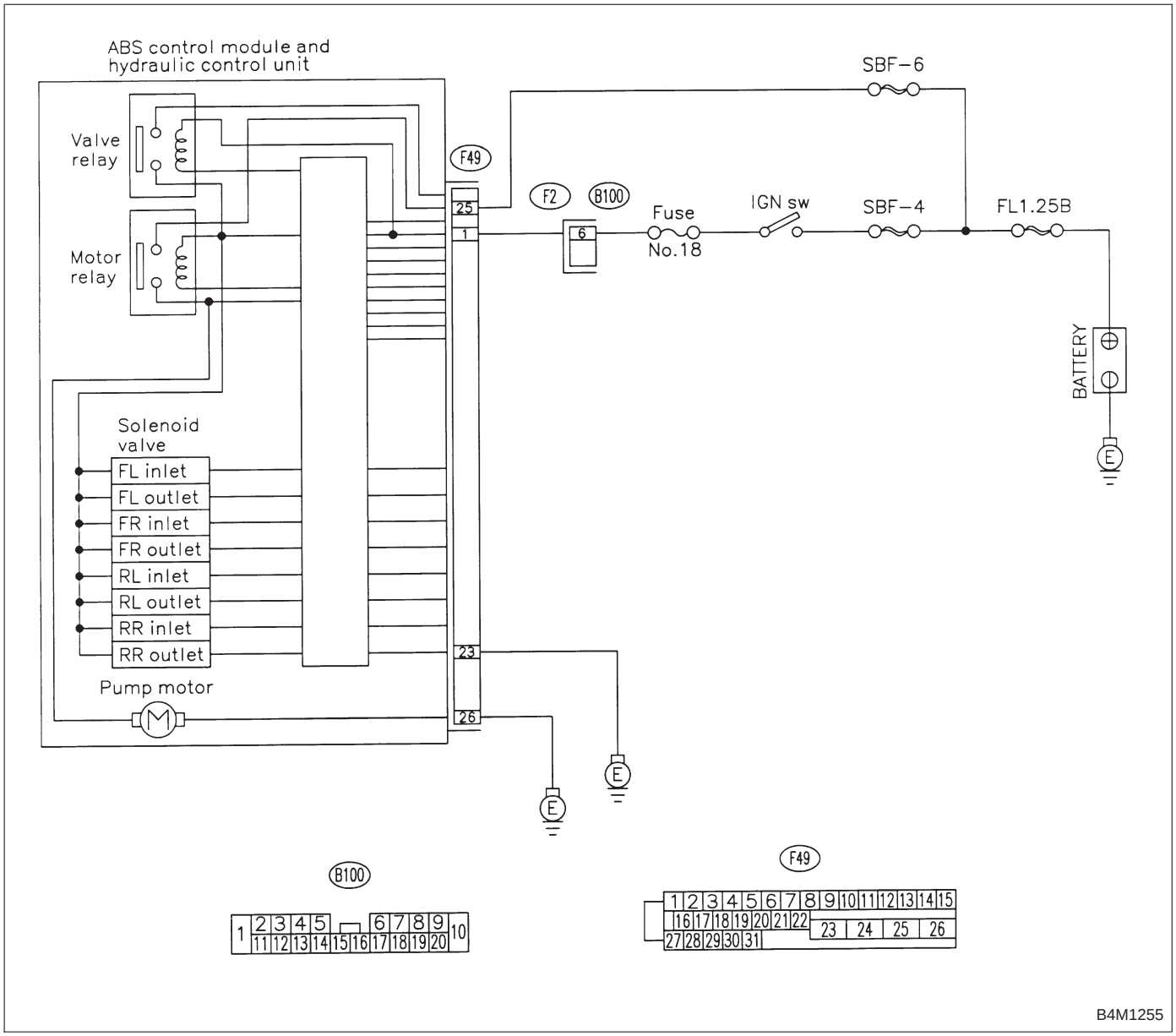
DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

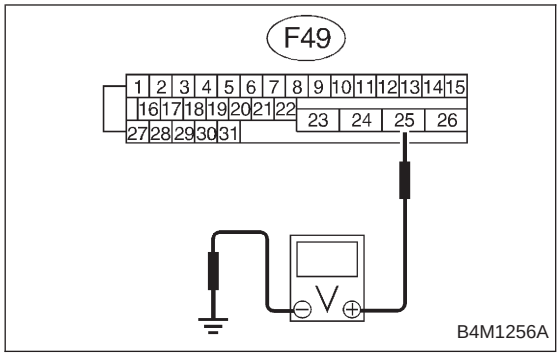
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1255



10AC1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

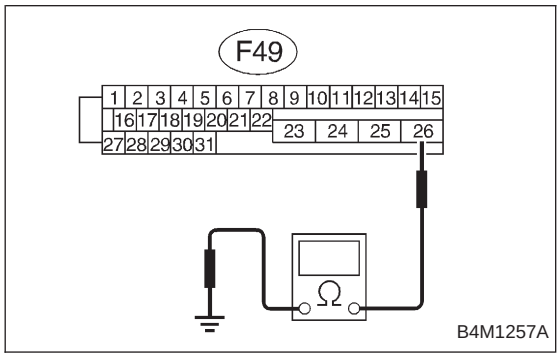
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Turn ignition switch to ON.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 25 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 13 V?***

YES : Go to step **10AC2**.

NO : Repair harness/connector between battery and ABSCM&H/U and check fuse SBF6.



10AC2	CHECK GROUND CIRCUIT OF MOTOR.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 26 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **10AC3**.

NO : Repair ABSCM&H/U ground harness.

10AC3	CHECK MOTOR OPERATION.

Operate the check sequence. <Ref. to 4-4 [W20D1].>

NOTE:
Use the diagnosis connector to operate the sequence control.

CHECK ***: Can motor revolution noise (buzz) be heard when carrying out the check sequence?***

YES : Go to step **10AC4**.

NO : Replace ABSCM&H/U.

10AC4	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK ***: Is there poor contact in connector between hydraclic unit, relay box and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10AC5**.

10AC5	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AC6**.

10AC6	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 52 (FB1)
M. RELAY ON

B4M0970

AD: TROUBLE CODE 52 M. RELAY ON — MOTOR RELAY ON FAILURE —

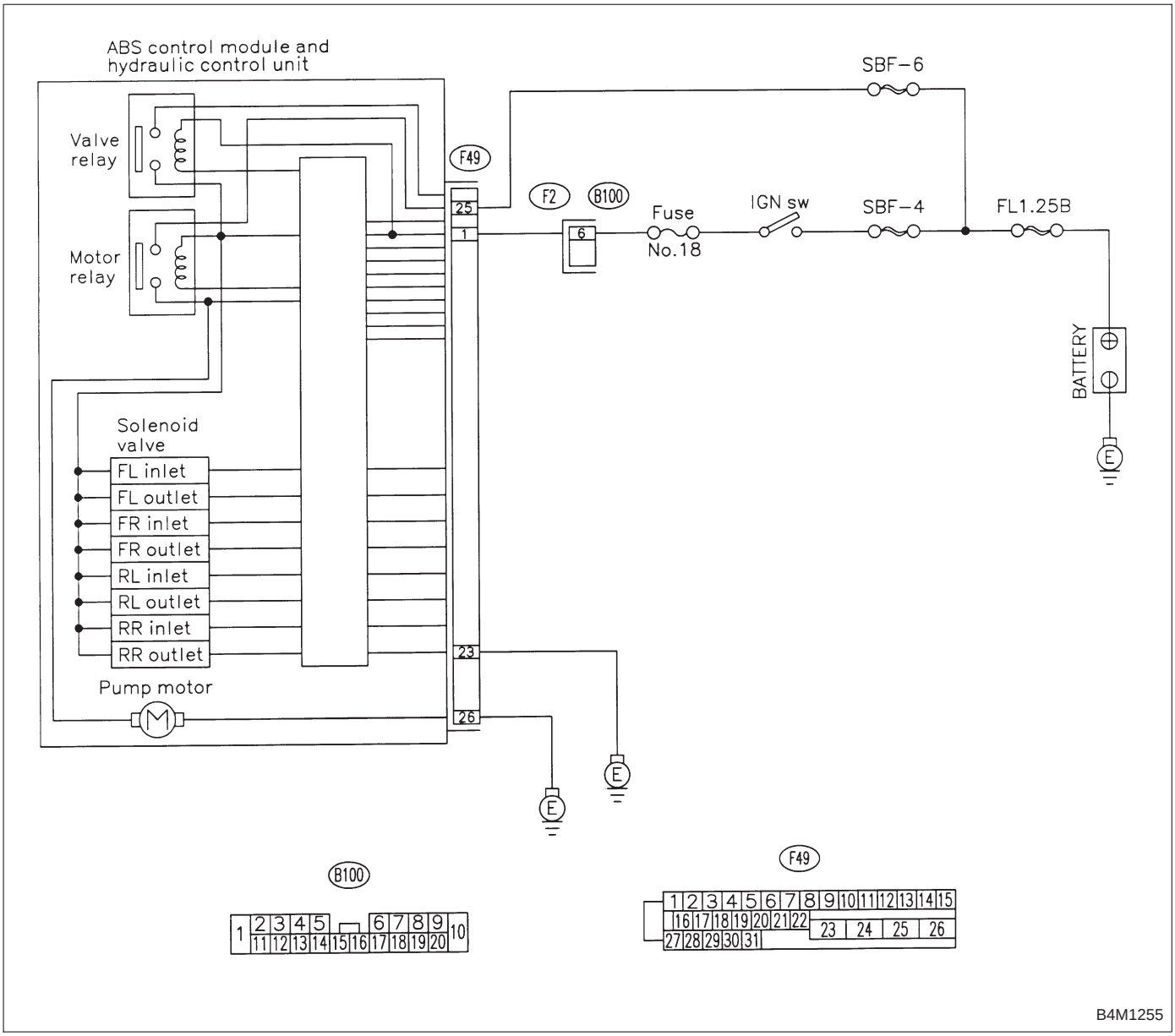
DIAGNOSIS:

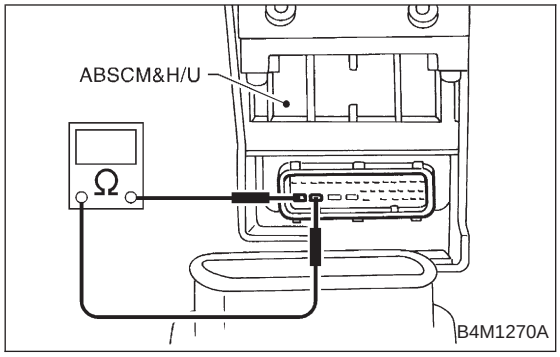
- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10AD1	CHECK MOTOR RELAY IN ABSCM&H/U.

Measure resistance between ABSCM&H/U terminals.

Terminals
No. 25 — No. 26:

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **10AD2**.

NO : Replace ABSCM&H/U.

10AD2	CHECK MOTOR OPERATION.

Operate the sequence control. <Ref. to 4-4 [W20D1].>

CHECK ***: Can motor revolution noise (buzz) be heard when carrying out the sequence control?***

YES : Go to step **10AD3**.

NO : Replace ABSCM&H/U.

10AD3	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK ***: Is there poor contact in connector between hydraulic unit, relay box and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10AD4**.

10AD4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AD5**.

10AD5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 52 (FB1)
MOTOR

B4M0971

AE: TROUBLE CODE 52 MOTOR — ABNORMAL MOTOR —

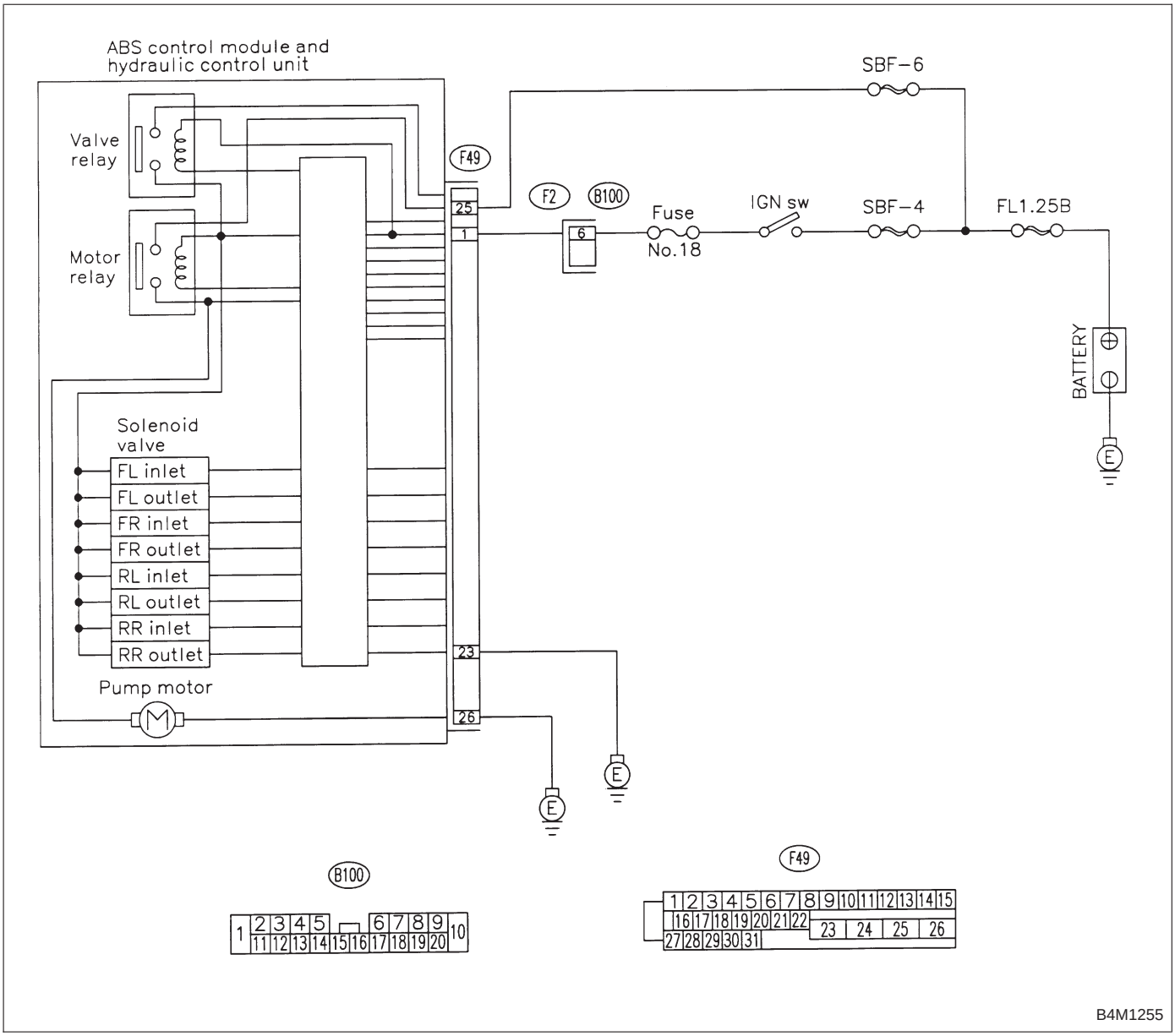
DIAGNOSIS:

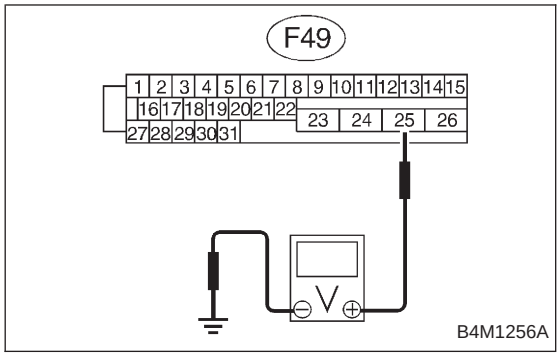
- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10AE1	CHECK INPUT VOLTAGE OF ABSCM&H/U.

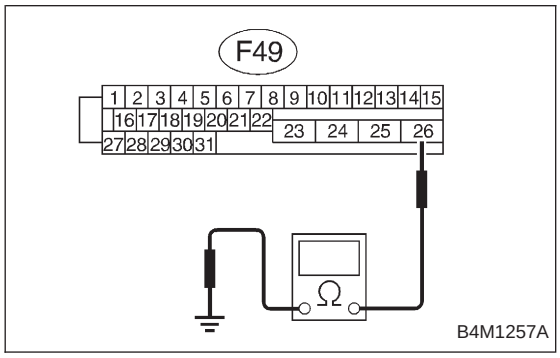
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Turn ignition switch to ON.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 25 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 13 V?***

YES : Go to step **10AE2**.

NO : Repair harness/connector between battery and ABSCM&H/U and check fuse SBF6.



10AE2	CHECK GROUND CIRCUIT OF MOTOR.

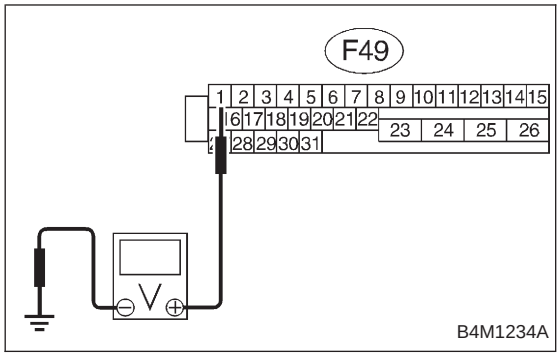
1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 26 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **10AE3**.

NO : Repair ABSCM&H/U ground harness.



10AE3	CHECK INPUT VOLTAGE OF ABSCM&H/U.

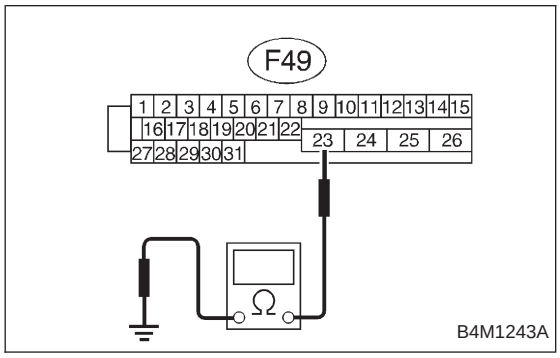
1) Run the engine at idle.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (−):

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **10AE4**.

NO : Repair harness connector between battery, ignition switch and ABSCM&H/U.



10AE4	CHECK GROUND CIRCUIT OF ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:

CHECK ***: Is the resistance less than 0.5 Ω?***

YES : Go to step **10AE5**.

NO : Repair ABSCM&H/U ground harness.

10AE5	CHECK MOTOR OPERATION.

Operate the sequence control. <Ref. to 4-4 [W20D1].>

NOTE:
Use the diagnosis connector to operate the sequence control.

CHECK ***: Can motor revolution noise (buzz) be heard when carrying out the sequence control?***

YES : Go to step **10AE6**.

NO : Replace hydraulic unit.

10AE6	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : ***Is there poor contact in connector between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10AE7**.

10AE7	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AE8**.

10AE8	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 54 (FB1)
BLS

B4M0972

AF: TROUBLE CODE 54 BLS — ABNORMAL STOP LIGHT SWITCH —

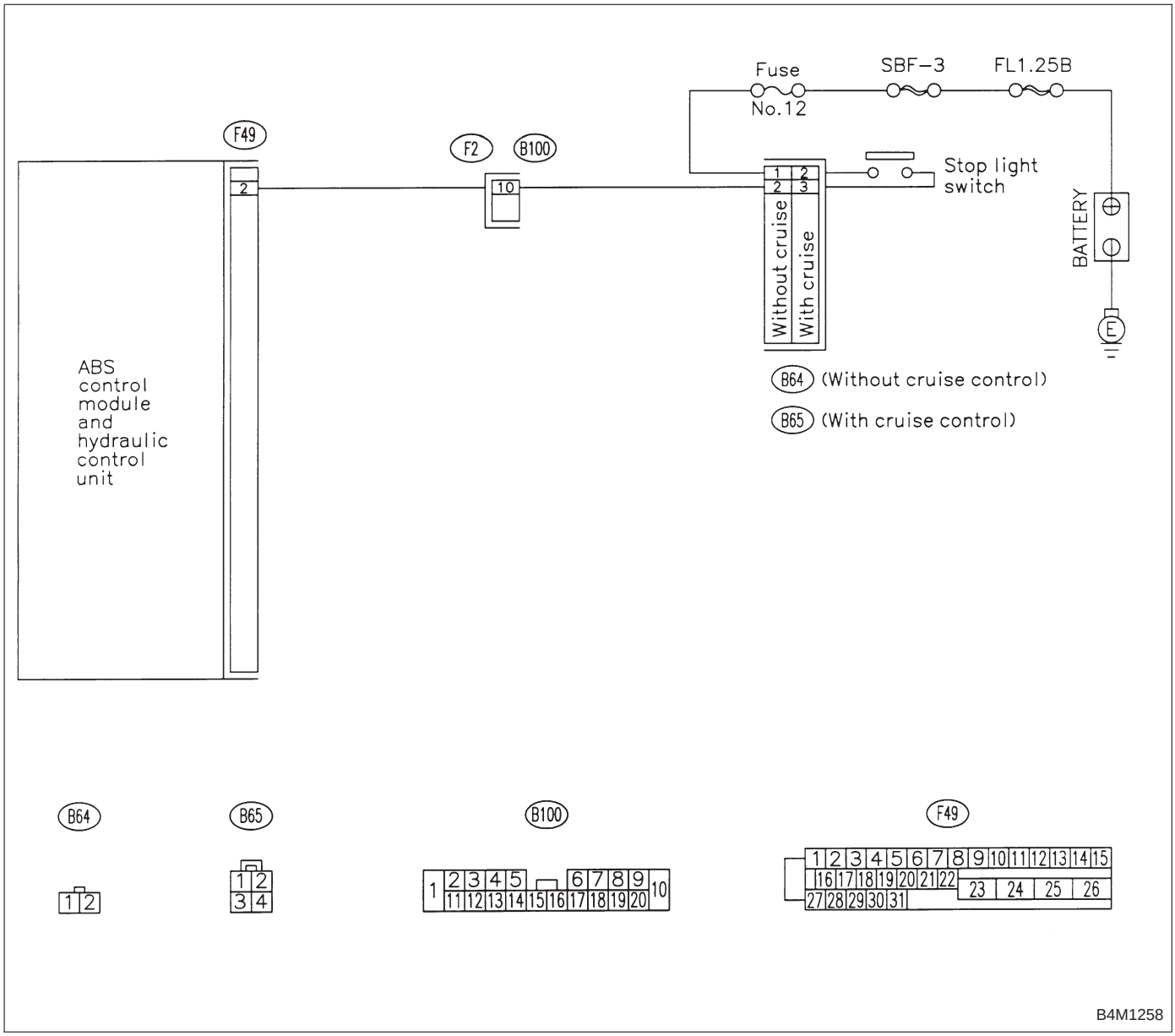
DIAGNOSIS:

- Faulty stop light switch

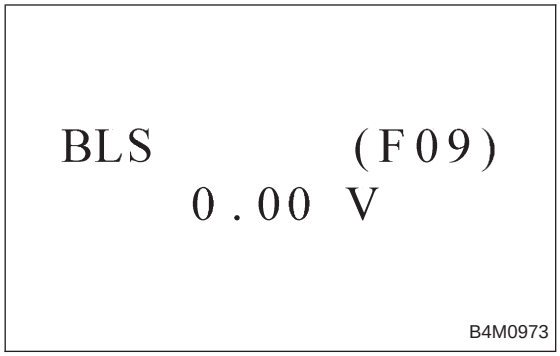
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1258

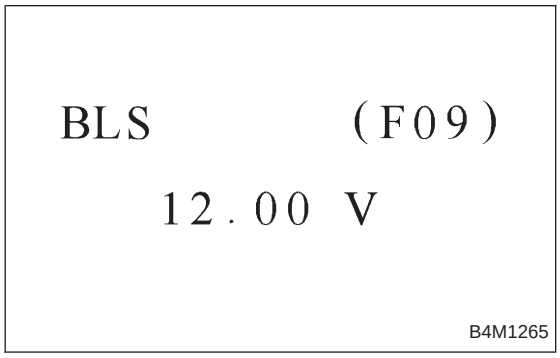


10AF1	CHECK OUTPUT OF STOP LIGHT SWITCH USING SELECT MONITOR.

1) Press [F], [0] and [9] on the select monitor.
2) Depress the brake pedal.
3) Read the stop light switch output on the select monitor display.

CHECK ***: Is the reading indicated on monitor display less than 1.5 V?***

YES : Go to step **10AF2**.
NO : Go to step **10AF3**.



10AF2	CHECK OUTPUT OF STOP LIGHT SWITCH USING SELECT MONITOR.

1) Release the brake pedal.
2) Read the stop light switch output on the select monitor display.

CHECK ***: Is the reading indicated on monitor display between 10 V and 15 V?***

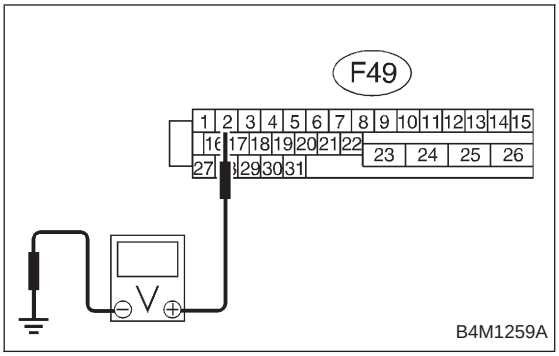
YES : Go to step **10AF5**.
NO : Go to step **10AF3**.

10AF3	CHECK IF STOP LIGHTS COME ON.

Depress the brake pedal.

CHECK ***: Do stop lights turn on?***

YES : Go to step **10AF4**.
NO : Repair stop lights circuit.



10AF4	CHECK OPEN CIRCUIT IN HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Depress brake pedal.
4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 2 — Chassis ground:

CHECK ***: Is the voltage between 10 V and 15 V?***

YES : Go to step **10AF5**.

NO : Repair harness between stop light switch and ABSCM&H/U connector.

10AF5	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connector between stop light switch and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10AF6**.

10AF6	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AF7**.

10AF7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 56 (FB1)
G SENSOR LINE

B4M0974

AG: TROUBLE CODE 56 G SENSOR LINE — OPEN OR SHORT CIRCUIT OF G SENSOR —

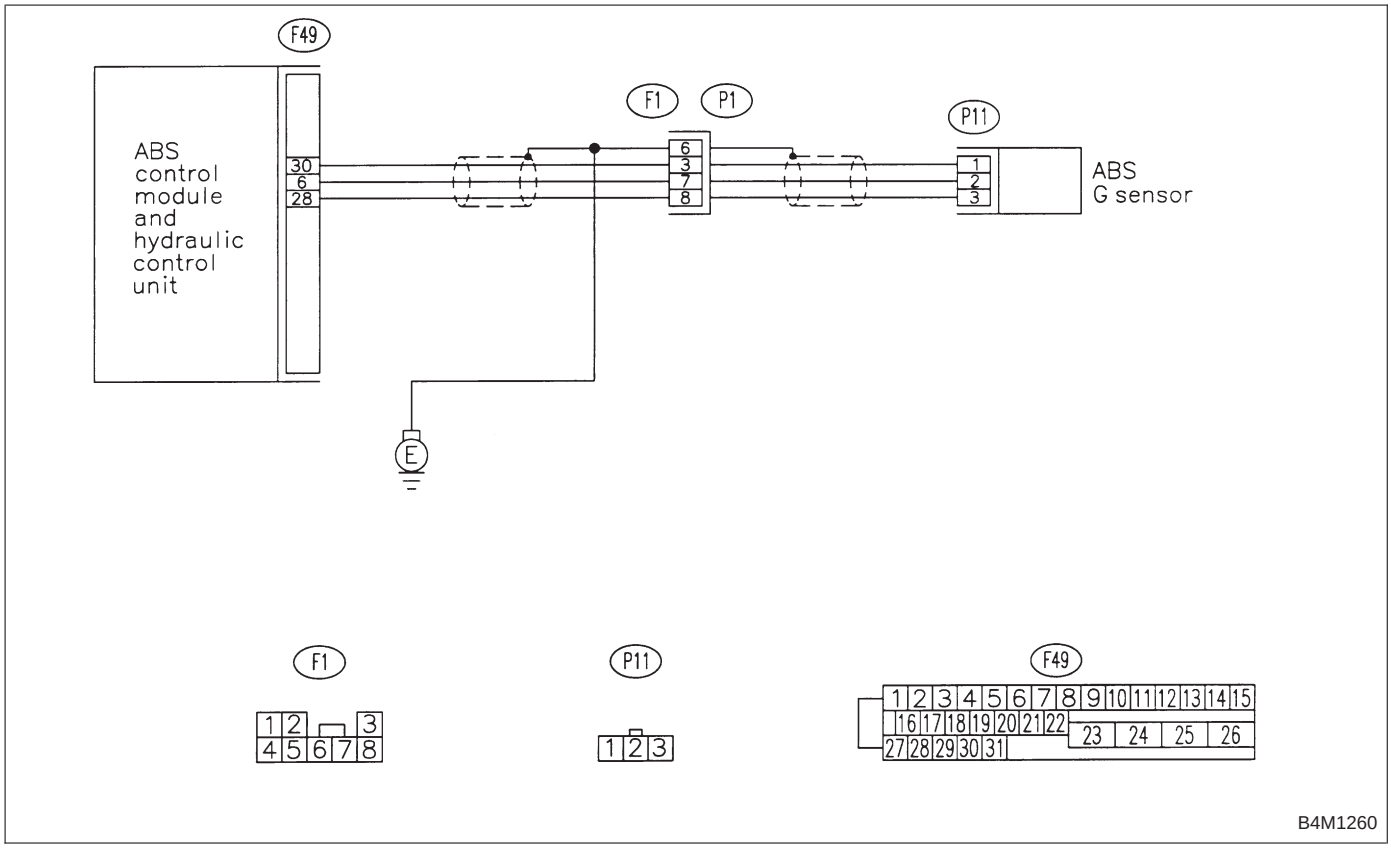
DIAGNOSIS:

- Faulty G sensor output voltage

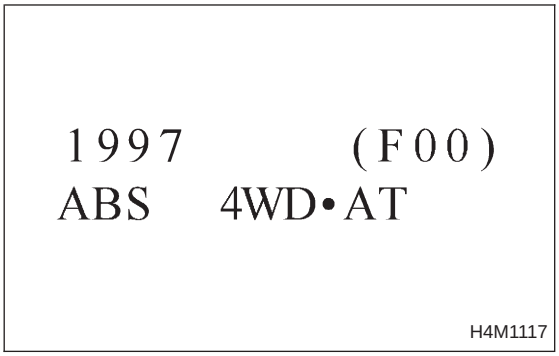
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1260



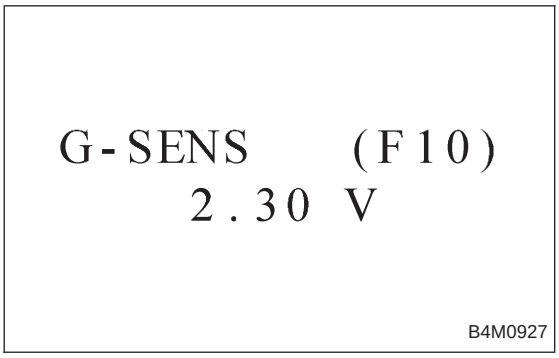
10AG1	CHECK SPECIFICATIONS OF ABSCM&H/U USING SELECT MONITOR.

1) Press [F], [0] and [0] on the select monitor.
2) Read the select monitor display.

CHECK ***: Is an ABSCM&H/U for 4WD model installed on a FWD model?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AG2**.



10AG2	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

1) Press [F], [1] and [0] on the select monitor.
2) Read the select monitor display.

CHECK ***: Is the indicated reading between 2.1 and 2.5 V when the G sensor is in horizontal position?***

YES : Go to step **10AG3**.

NO : Go to step **10AG6**.

10AG3	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10AG4**.

10AG4	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

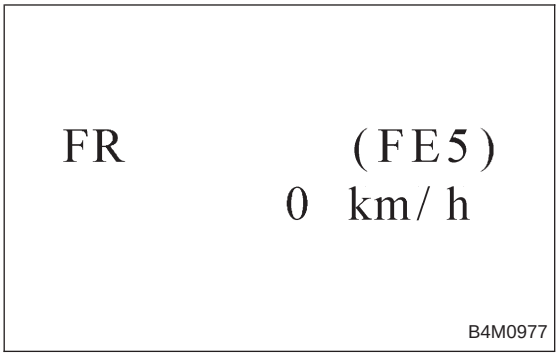
NO : Go to step **10AG5**.

10AG5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



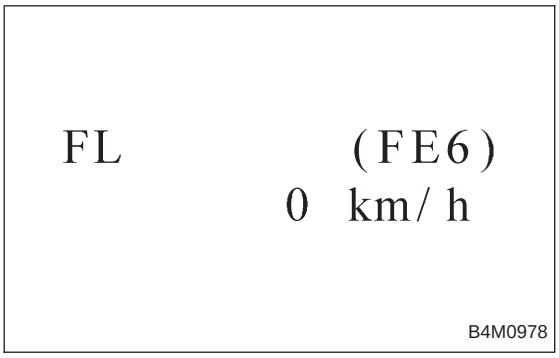
10AG6	CHECK FREEZE FRAME DATA.

1) Press [F], [E] and [5] on the select monitor.
2) Read the select monitor display.

CHECK : ***Is the reading indicated on monitor display 0 km?***

YES : Go to step **10AG7**.

NO : Go to step **10AG15**.



10AG7	CHECK FREEZE FRAME DATA.

1) Press the scroll key so that FE6 appears on the monitor display.
2) Read the select monitor display.

CHECK : ***Is the reading indicated on monitor display 0 km?***

YES : Go to step **10AG8**.

NO : Go to step **10AG15**.

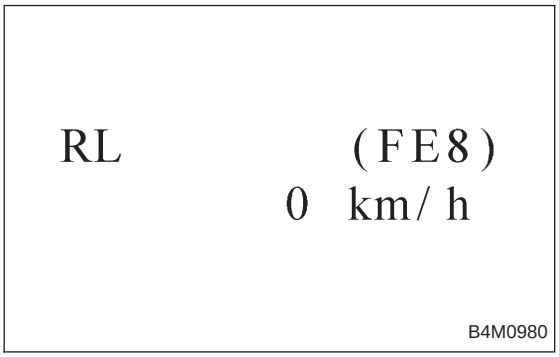
10AG8	CHECK FREEZE FRAME DATA.

1) Press the scroll key so that FE7 appears on the monitor display.
2) Read the select monitor display.

CHECK : ***Is the reading indicated on monitor display 0 km?***

YES : Go to step **10AG9**.

NO : Go to step **10AG15**.



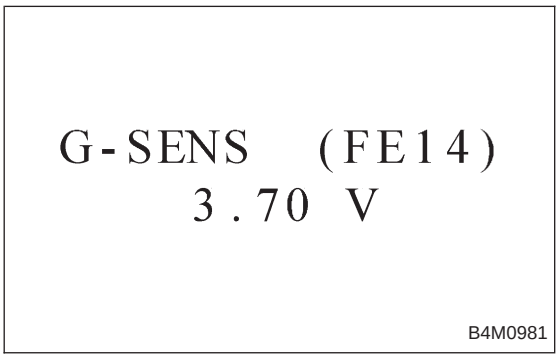
10AG9	CHECK FREEZE FRAME DATA.

1) Press the scroll key so that FE8 appears on the monitor display.
2) Read the select monitor display.

CHECK : ***Is the reading indicated on monitor display 0 km?***

YES : Go to step **10AG10**.

NO : Go to step **10AG15**.



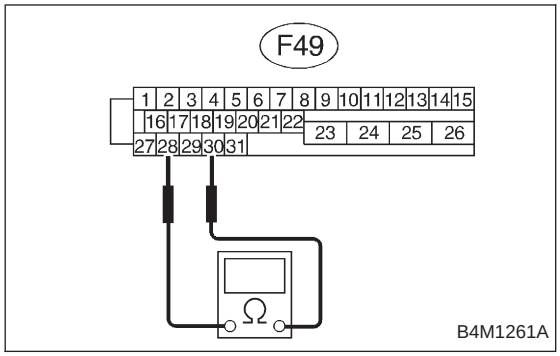
10AG10	CHECK FREEZE FRAME DATA.

1) Press the scroll key so that FE14 appears on the monitor display.
2) Read the select monitor display.

CHECK : ***Is the reading indicated on monitor display more than 3.65 V?***

YES : Go to step **10AG11**.

NO : Go to step **10AG15**.



10AG11	CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
(F49) No. 30 — No. 28:

CHECK ***: Is the resistance between 4.3 and 4.9 kΩ?***

YES : Go to step **10AG12**.

NO : Repair harness/connector between G sensor and ABSCM&H/U.

10AG12	CHECK POOR CONTACT IN CONNECTORS.

CHECK ***: Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10AG13**.

10AG13	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

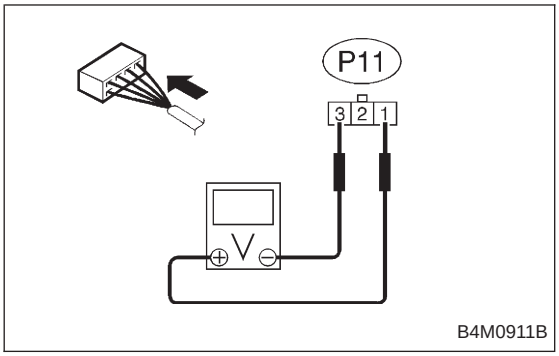
NO : Go to step **10AG14**.

10AG14	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



10AG15	CHECK INPUT VOLTAGE OF G SENSOR.

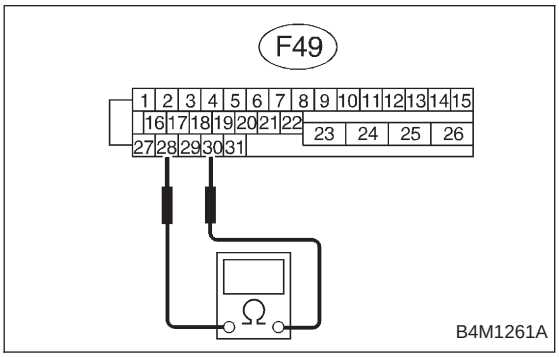
1) Turn ignition switch to OFF.
2) Remove console box.
3) Disconnect G sensor from body. (Do not disconnect connector.)
4) Turn ignition switch to ON.
5) Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 1 (+) — No. 3 (−):

CHECK ***: Is the voltage between 4.75 and 5.25 V?***

YES : Go to step **10AG16**.

NO : Repair harness/connector between G sensor and ABSCM&H/U.



10AG16	CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

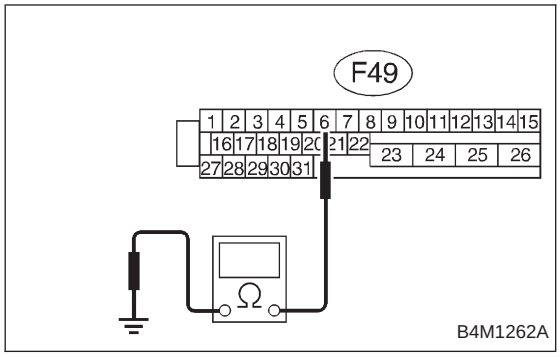
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
(F49) No. 30 — No. 28:

CHECK ***: Is the resistance between 4.3 and 4.9 kΩ?***

YES : Go to step **10AG17**.

NO : Repair harness/connector between G sensor and ABSCM&H/U.



10AG17	CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS.

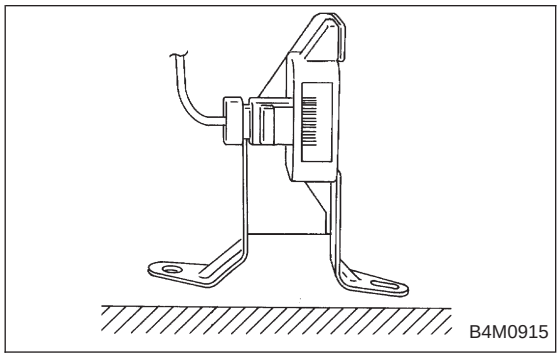
1) Disconnect connector from G sensor.
2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **10AG18**.

NO : Repair harness between G sensor and ABSCM&H/U.



10AG18	CHECK G SENSOR.

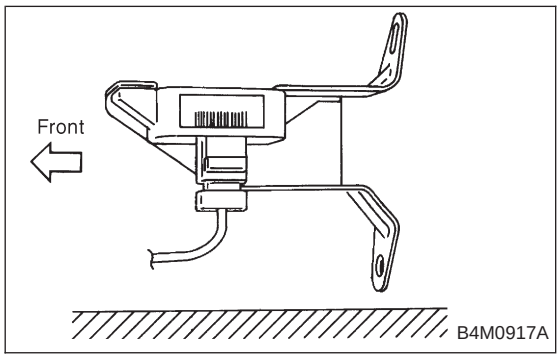
1) Connect connector to G sensor.
2) Connect connector to ABSCM&H/U.
3) Turn ignition switch to ON.
4) Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (−):

CHECK ***: Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?***

YES : Go to step **10AG19**.

NO : Replace G sensor.



10AG19	CHECK G SENSOR.

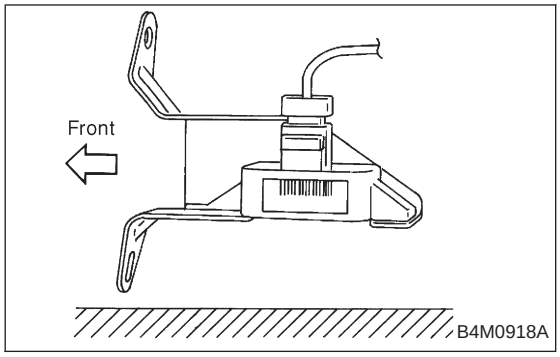
Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (−):

CHECK ***: Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?***

YES : Go to step **10AG20**.

NO : Replace G sensor.



10AG20	CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (−):

CHECK ***: Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?***

YES : Go to step **10AG21**.

NO : Replace G sensor.

10AG21	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK ***: Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10AG22**.

10AG22	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AG23**.

10AG23	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

D•NEW 56 (FB1)
G SENSOR +B

B4M0982

AH: TROUBLE CODE 56 G SENSOR +B — BATTERY SHORT OF G SENSOR —

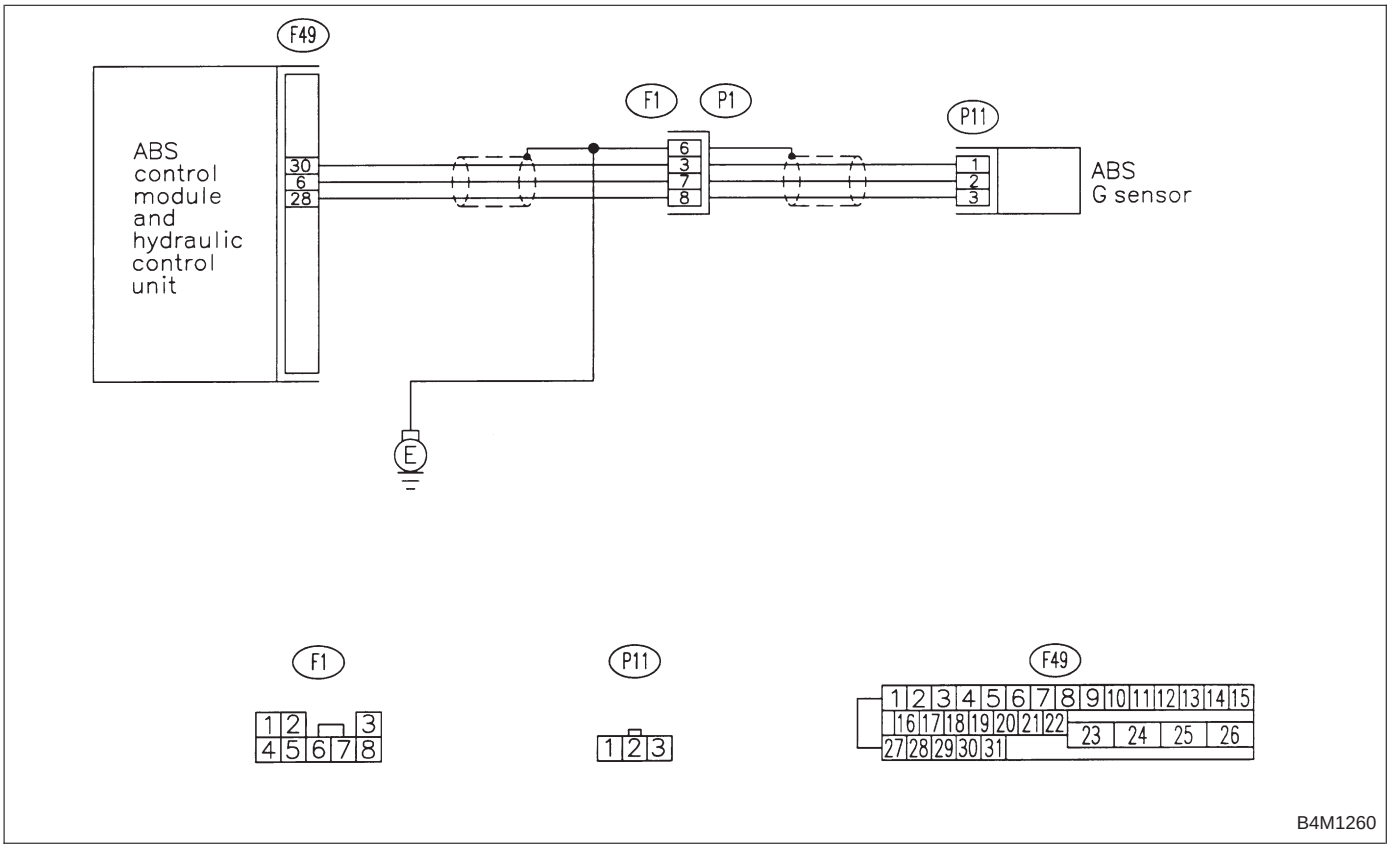
DIAGNOSIS:

- Faulty G sensor output voltage

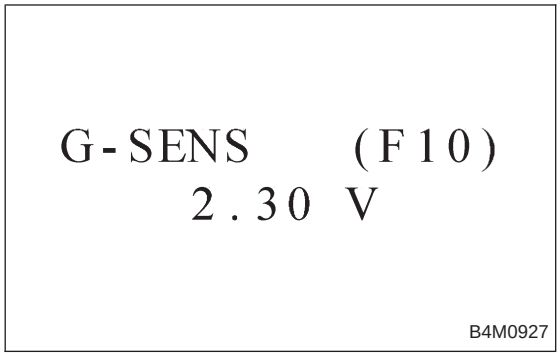
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M1260



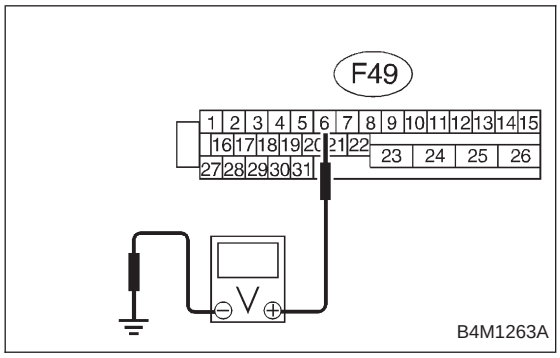
10AH1	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

1) Press [F], [1] and [0] on the select monitor.
2) Read the select monitor display.

CHECK ***: Is the indicated reading between 2.1 and 2.5 V when the G sensor is in horizontal position?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AH2**.



10AH2	CHECK BATTERY SHORT OF HARNESS.

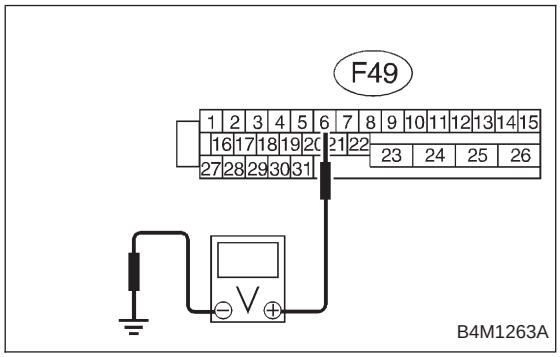
1) Turn ignition switch to OFF.
2) Remove console box.
3) Disconnect connector from G sensor.
4) Disconnect connector from ABSCM&H/U.
5) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **10AH3**.

NO : Repair harness between G sensor and ABSCM&H/U.



10AH3	CHECK BATTERY SHORT OF HARNESS.

1) Turn ignition switch to ON.
2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 1 V?***

YES : Go to step **10AH4**.

NO : Repair harness between G sensor and ABSCM&H/U.

10AH4	CHECK ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AH5**.

10AH5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

AI: TROUBLE CODE 56 G SENSOR Hμ — ABNORMAL G SENSOR HIGH μ OUTPUT —

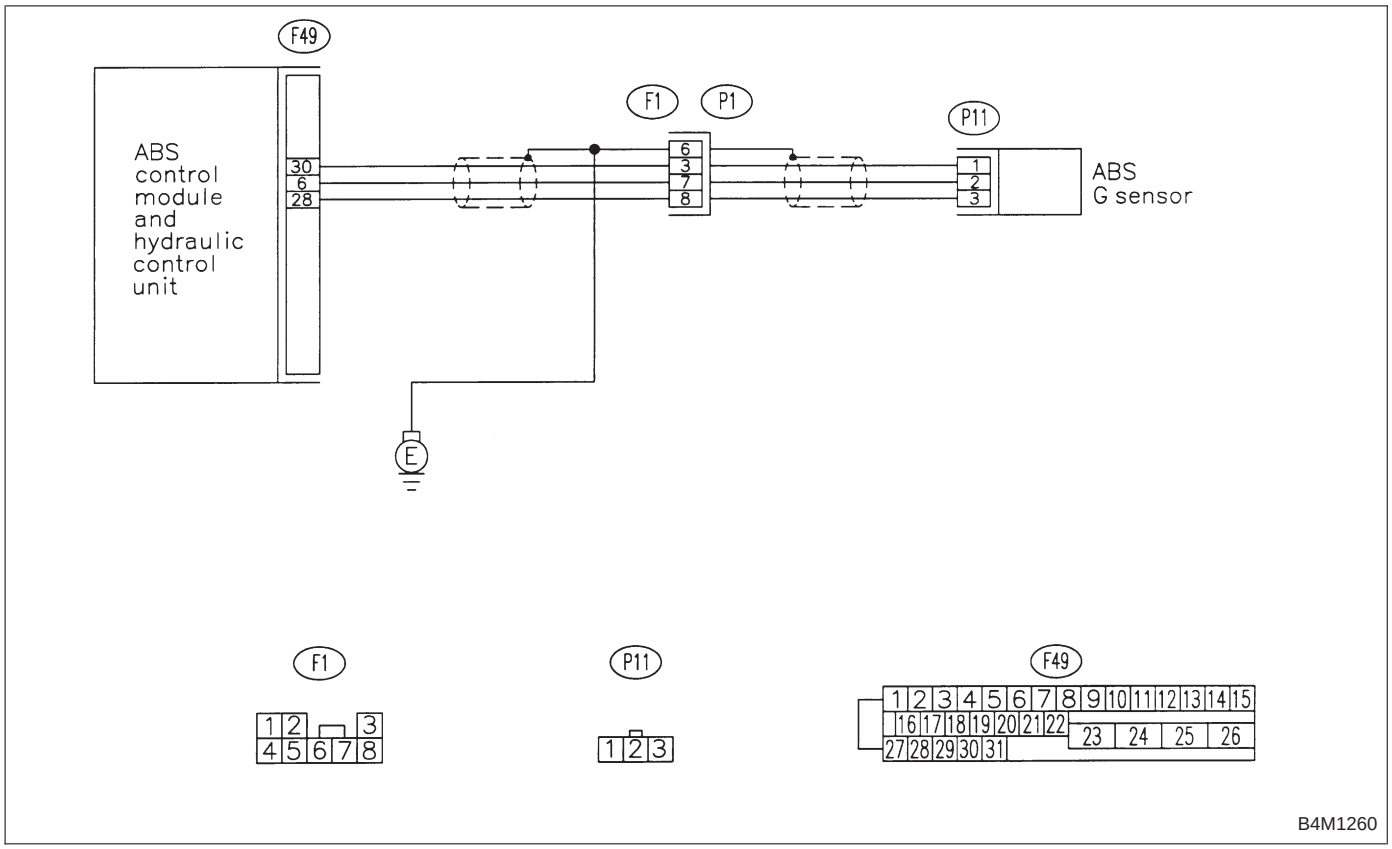
DIAGNOSIS:

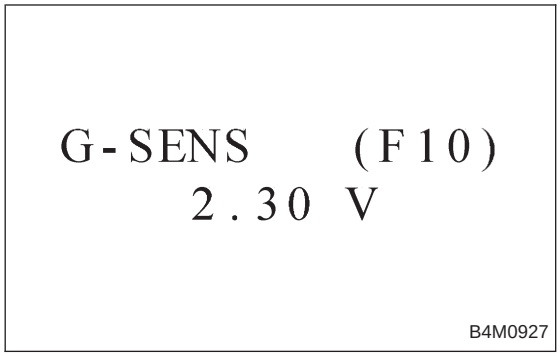
- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10AI1	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

1) Press [F], [1] and [0] on the select monitor.
2) Read the select monitor display.

CHECK ***: Is the indicated reading 2.3±0.2 V when the G sensor is in horizontal position?***

YES : Go to step **10AI2**.

NO : Go to step **10AI6**.

10AI2	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK ***: Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10AI3**.

10AI3	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

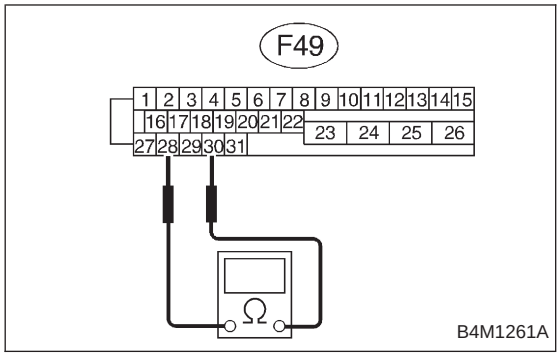
NO : Go to step **10AI4**.

10AI4	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



10AI5	CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

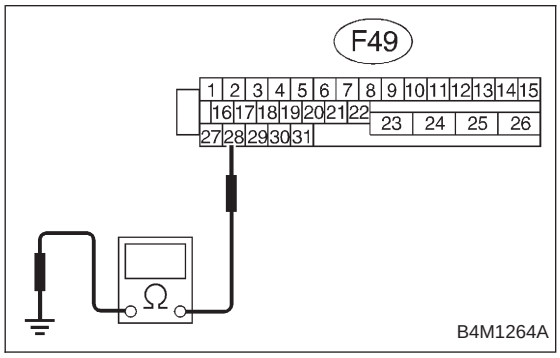
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
(F49) No. 30 — No. 28:

CHECK ***: Is the resistance between 4.3 and 4.9 kΩ?***

YES : Go to step **10AI6**.

NO : Repair harness/connector between G sensor and ABSCM&H/U.



10AI6	CHECK GROUND SHORT OF HARNESS.

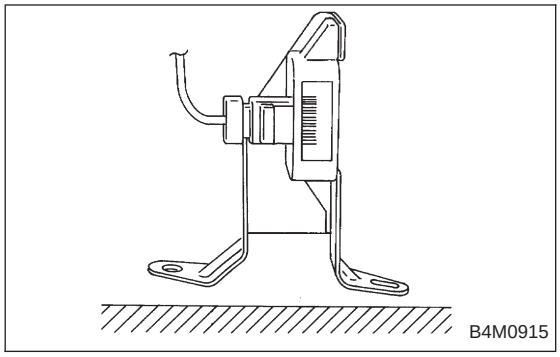
Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 28 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***

YES : Go to step **10AI7**.

NO : Repair harness between G sensor and ABSCM&H/U.
Replace ABSCM&H/U.



10AI7	CHECK G SENSOR.

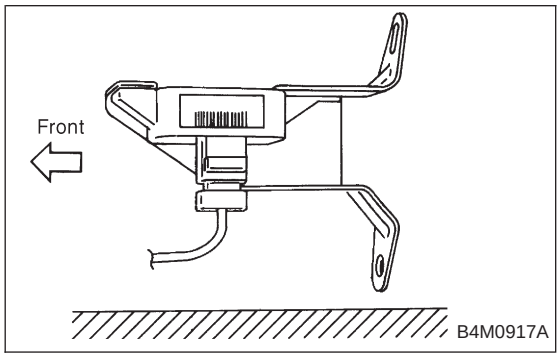
1) Remove console box.
2) Remove G sensor from vehicle.
3) Connect connector to G sensor.
4) Connect connector to ABSCM&H/U.
5) Turn ignition switch to ON.
6) Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (−):

CHECK ***: Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?***

YES : Go to step **10AI8**.

NO : Replace G sensor.



10AI8	CHECK G SENSOR.

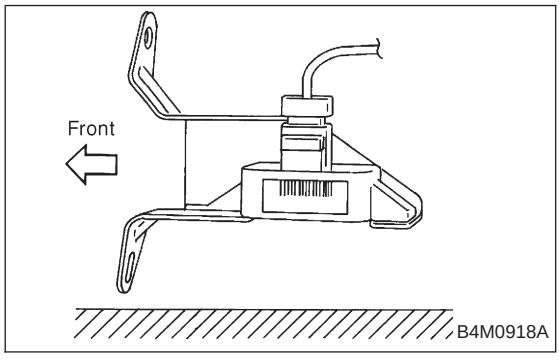
Measure voltage between G sensor connector terminals.

Connector & terminal
(R70) No. 2 (+) — No. 1 (−):

CHECK ***: Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?***

YES : Go to step **10AI9**.

NO : Replace G sensor.



10AI9	CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal
(R70) No. 2 (+) — No. 1 (−):

CHECK ***: Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?***

YES : Go to step **10AI10**.

NO : Replace G sensor.

10AI10	CHECK ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

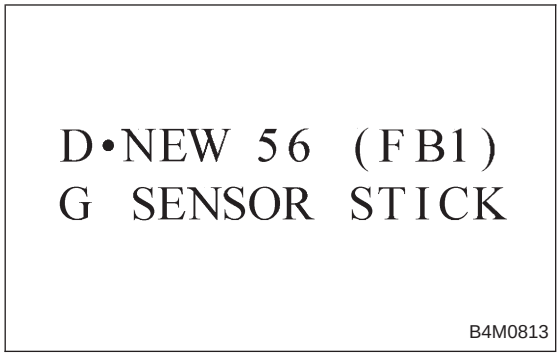
NO : Go to step **10AI11**.

10AI11	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



AJ: TROUBLE CODE 56 G SENSOR STICK — G SENSOR OUTPUT IS STUCK —

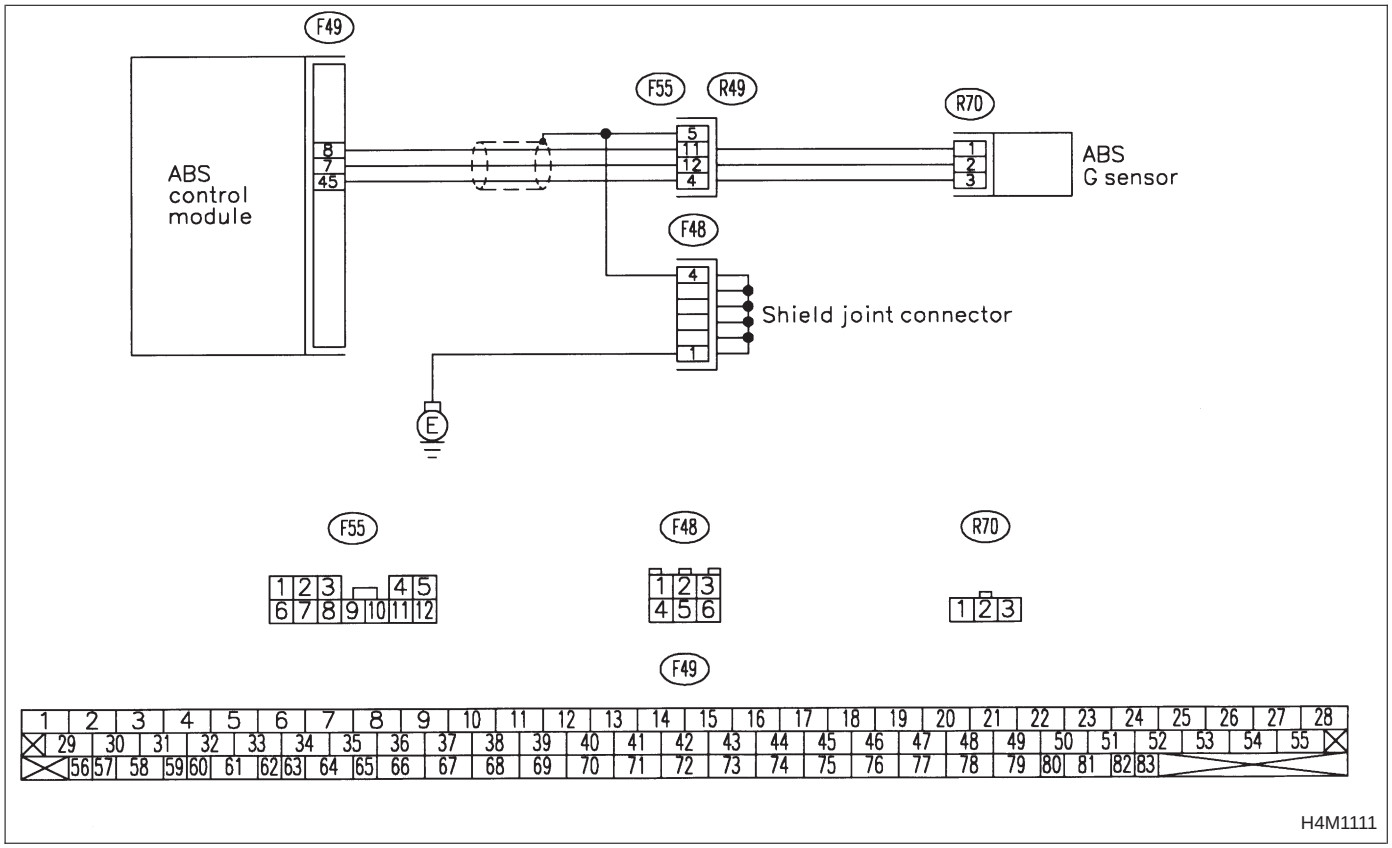
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:

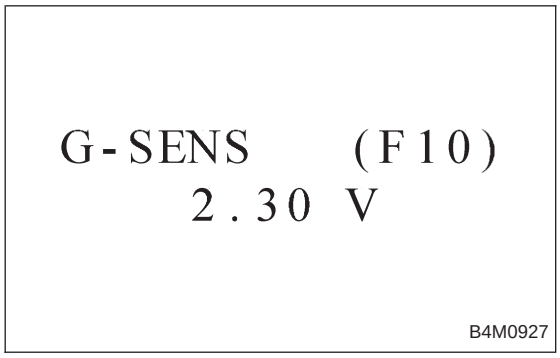


10AJ1	CHECK ALL FOUR WHEELS FOR FREE TURNING.

CHECK : ***Have the wheels been turned freely such as when the vehicle is lifted up, or operated on a rolling road?***

YES : The ABS is normal. Erase the trouble code.

NO : Go to step **10AJ2**.



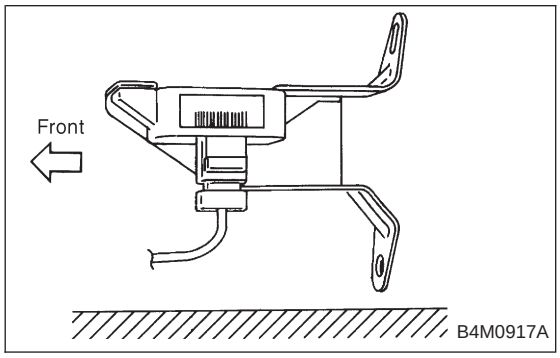
10AJ2	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

1) Press [F], [1] and [0] on the select monitor.
2) Read the select monitor display.

CHECK : ***Is the indicated reading between 2.1 and 2.5 V when the vehicle is in horizontal position?***

YES : Go to step **10AJ3**.

NO : Go to step **10AJ8**.



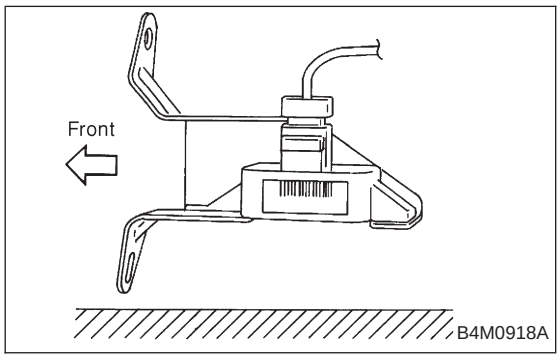
10AJ3	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

1) Turn ignition switch to OFF.
2) Remove console box.
3) Remove G sensor from vehicle. (Do not disconnect connector.)
4) Turn ignition switch to ON.
5) Press [F], [1] and [0] on the select monitor.
6) Read the select monitor display.

CHECK : ***Is the indicated reading between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?***

YES : Go to step **10AJ4**.

NO : Replace G sensor.



10AJ4	CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

Read the select monitor display.

CHECK : ***Is the indicated reading between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?***

YES : Go to step **10AJ5**.

NO : Replace G sensor.

10AJ5	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : ***Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].>***

YES : Repair connector.

NO : Go to step **10AJ6**.

10AJ6	CHECK ABSCM&H/U.

1) Connect all connectors.
2) Erase the memory.
3) Perform inspection mode.
4) Read out the trouble code.

CHECK : ***Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

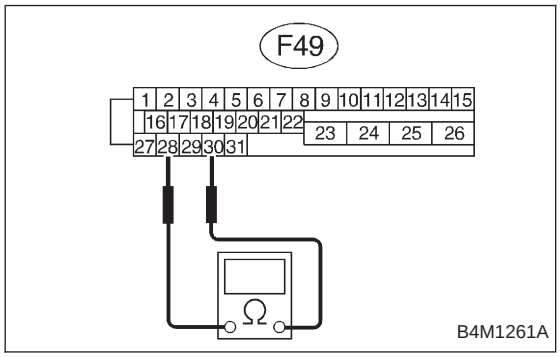
NO : Go to step **10AJ7**.

10AJ7	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : ***Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.



10AJ8	CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

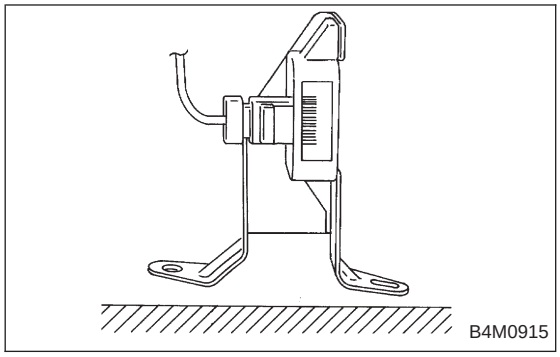
1) Turn ignition switch to OFF.
2) Disconnect connector from ABSCM&H/U.
3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
(F49) No. 30 — No. 28:

CHECK : ***Is the resistance between 4.3 and 4.9 kΩ?***

YES : Go to step **10AJ9**.

NO : Repair harness/connector between G sensor and ABSCM&H/U.



10AJ9	CHECK G SENSOR.

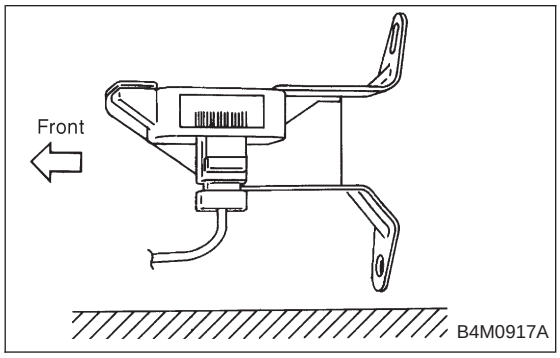
1) Remove console box.
2) Remove G sensor from vehicle.
3) Connect connector to G sensor.
4) Connect connector to ABSCM&H/U.
5) Turn ignition switch to ON.
6) Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (−):

CHECK ***: Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?***

YES : Go to step **10AJ10**.

NO : Replace G sensor.



10AJ10	CHECK G SENSOR.

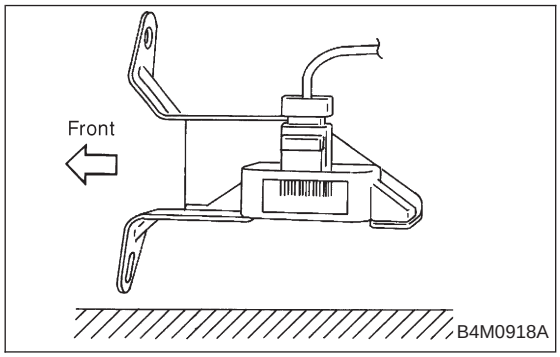
Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (−):

CHECK ***: Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?***

YES : Go to step **10AJ11**.

NO : Replace G sensor.



10AJ11	CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal
(P11) No. 2 (+) — No. 1 (−):

CHECK ***: Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?***

YES : Go to step **10AJ12**.

NO : Replace G sensor.

10AJ12	CHECK ABSCM&H/U.

1) Turn ignition switch to OFF.
2) Connect all connectors.
3) Erase the memory.
4) Perform inspection mode.
5) Read out the trouble code.

CHECK ***: Is the same trouble code as in the current diagnosis still being output?***

YES : Replace ABSCM&H/U.

NO : Go to step **10AJ13**.

10AJ13	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK ***: Are other trouble codes being output?***

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

11. General Diagnostics Table

A: SYMPTOMS AND PROBABLE CAUSES

Symptom		Probable faulty units/parts
Vehicle instability during braking	Vehicle pulls to either side.	● ABSCM&H/U (solenoid valve) ● ABS sensor ● Brake (caliper & piston, pads) ● Wheel alignment ● Tire specifications, tire wear and air pressures ● Incorrect wiring or piping connections ● Road surface (uneven, camber)
	Vehicle spins.	● ABSCM&H/U (solenoid valve) ● ABS sensor ● Brake (pads) ● Tire specifications, tire wear and air pressures ● Incorrect wiring or piping connections
Poor braking	Long braking/stopping distance	● ABSCM&H/U (solenoid valve) ● Brake (pads) ● Air in brake line ● Tire specifications, tire wear and air pressures ● Incorrect wiring or piping connections
	Wheel locks.	● ABSCM&H/U (solenoid valve, motor) ● ABS sensor ● Incorrect wiring or piping connections
	Brake dragging	● ABSCM&H/U (solenoid valve) ● ABS sensor ● Master cylinder ● Brake (caliper & piston) ● Parking brake ● Axle & wheels ● Brake pedal play
	Long brake pedal stroke	● Air in brake line ● Brake pedal play
	Vehicle pitching	● Suspension play or fatigue (reduced damping) ● Incorrect wiring or piping connections ● Road surface (uneven)
	Unstable or uneven braking	● ABSCM&H/U (solenoid valve) ● ABS sensor ● Brake (caliper & piston, pads) ● Tire specifications, tire wear and air pressures ● Incorrect wiring or piping connections ● Road surface (uneven)
Vibration and/or noise (while driving on slippery roads)	Excessive pedal vibration	● Incorrect wiring or piping connections ● Road surface (uneven)
	Noise from ABSCM&H/U	● ABSCM&H/U (mount bushing) ● ABS sensor ● Brake piping
	Noise from front of vehicle	● ABSCM & H/U (mount bushing) ● ABS sensor ● Master cylinder ● Brake (caliper & piston, pads, rotor) ● Brake piping ● Brake booster & check valve ● Suspension play or fatigue
	Noise from rear of vehicle	● ABS sensor ● Brake (caliper & piston, pads, rotor) ● Parking brake ● Brake piping ● Suspension play or fatigue

B: CHECKING THE HYDRAULIC UNIT OPERATION

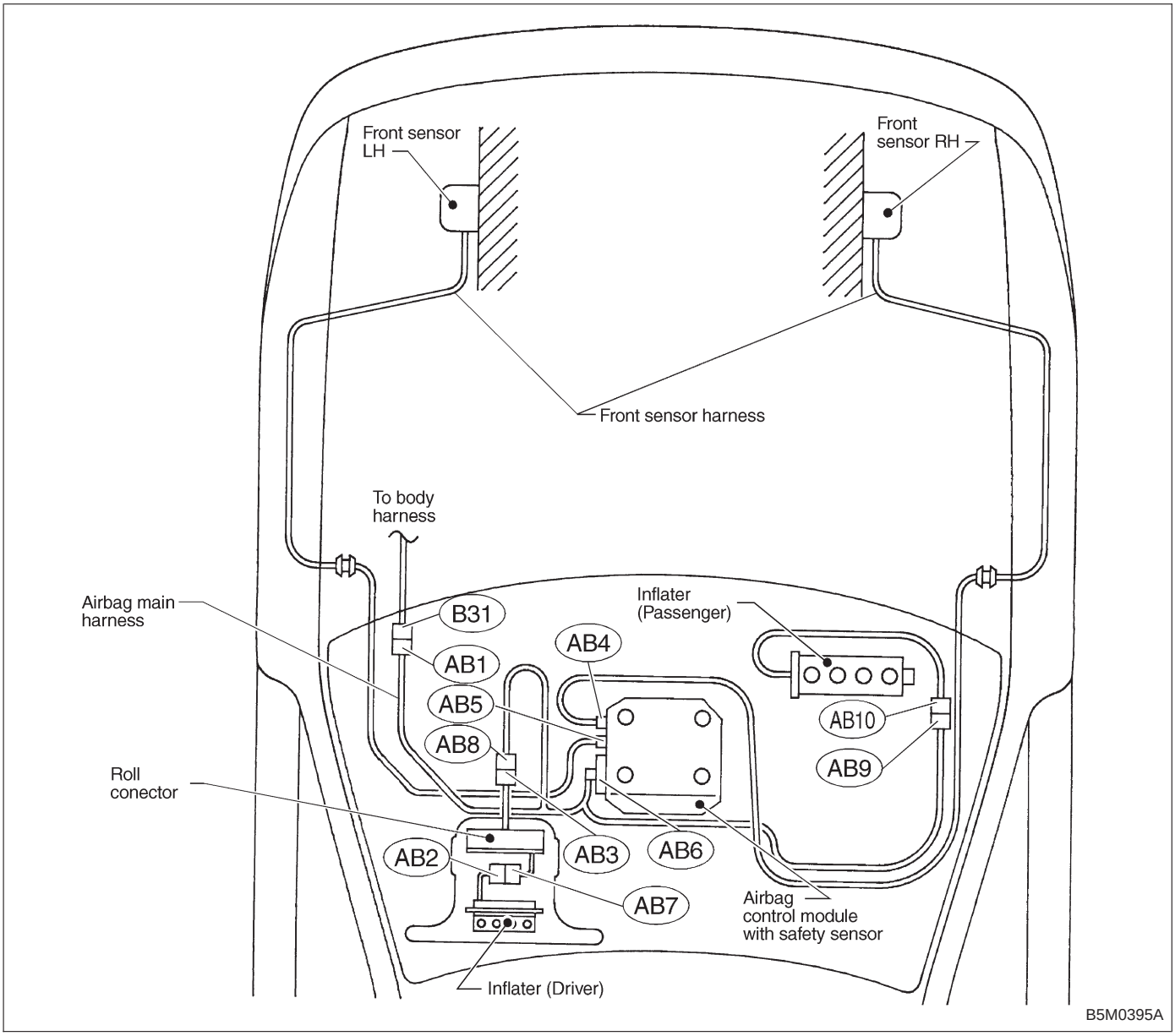
11B1	**PREPARING THE BRAKE TESTER.**

CHECK ***: Is the brake tester available?***

YES : CHECKING THE HYDRAULIC UNIT ABS OPERATION WITH BRAKE TESTER <Ref. to 4-4 [W20C2].>

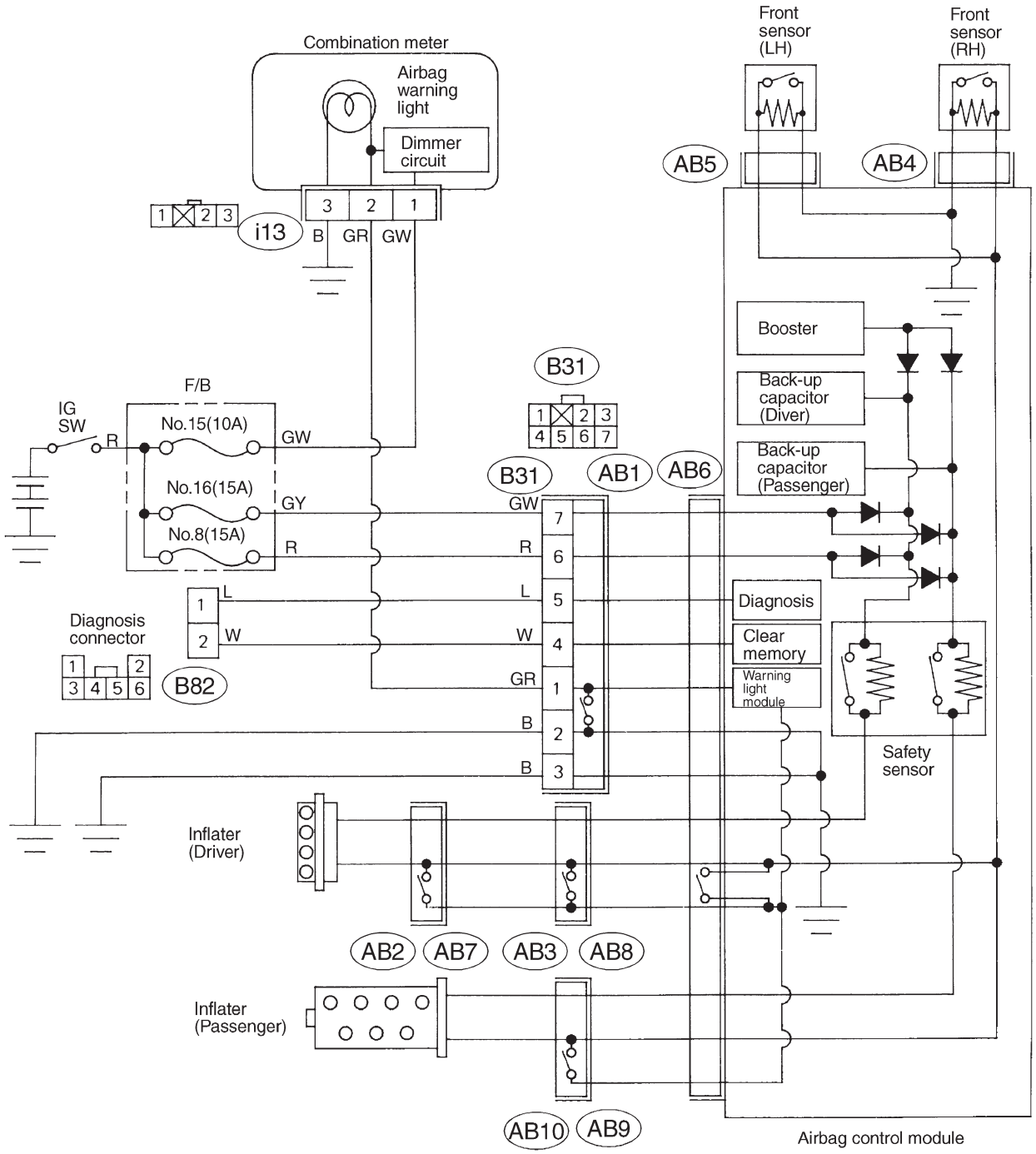
NO : CHECKING THE HYDRAULIC UNIT ABS OPERATION BY PRESSURE GAUGE <Ref. to 4-4 [W20C1].>

1. Electrical Components Location



Connector No.	(AB1)	(AB2)	(AB3)	(AB4)	(AB5)	(AB6)	(AB7)	(AB8)	(AB9)	(AB10)
Pole	7	3	3	2	2	12	3	3	3	3
Color	Yellow	Yellow	Yellow	Blue	Orange	Yellow	Yellow	Yellow	Yellow	Yellow
Male/Female	Male	Female	Female	Female	Female	Female	Male	Male	Male	Female

2. Schematic



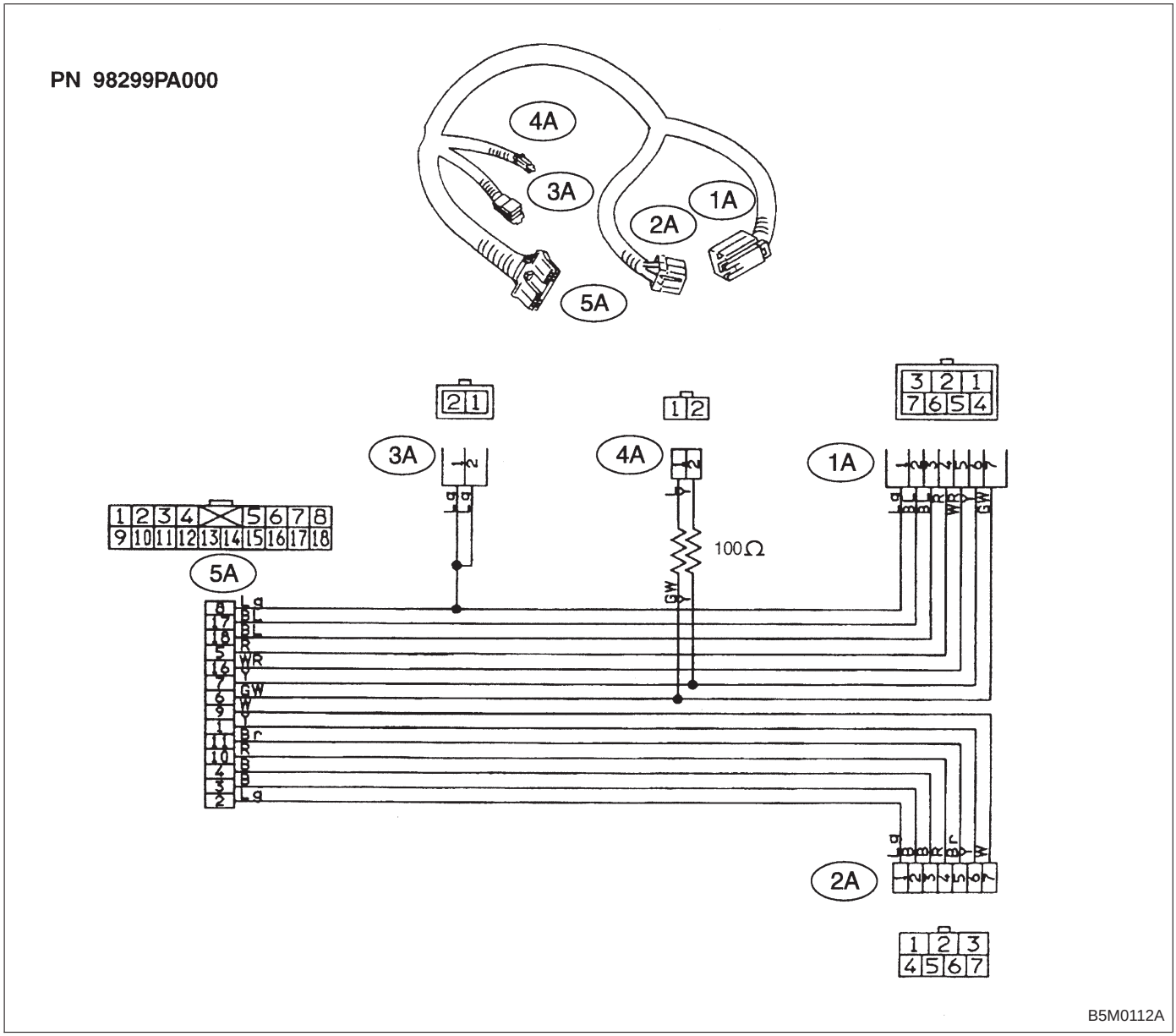
B5M0111B

3. Tools for Diagnostics

CAUTION:
Be sure to use specified test harness A, B or C when measuring voltage, resistance, etc. of AIRBAG system component parts.

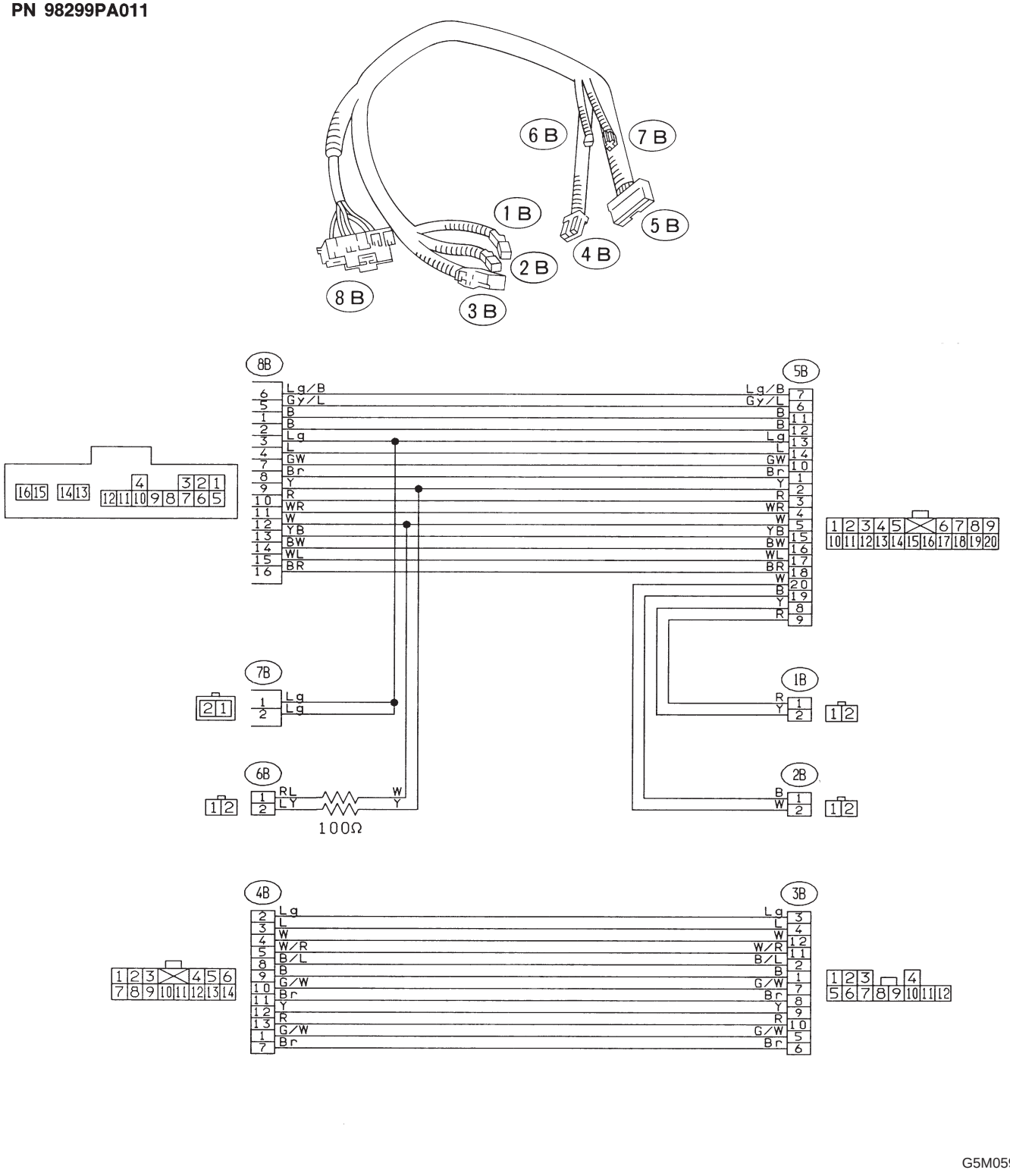
A: TEST HARNESS A

PN 98299PA000



B: TEST HARNESS B2

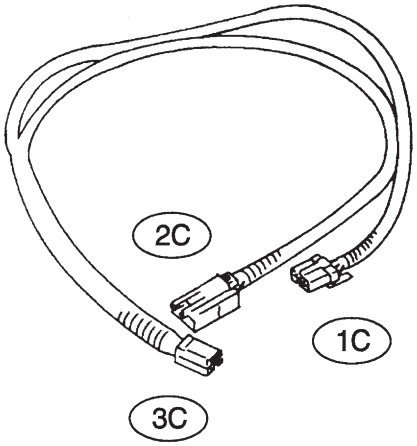
PN 98299PA011

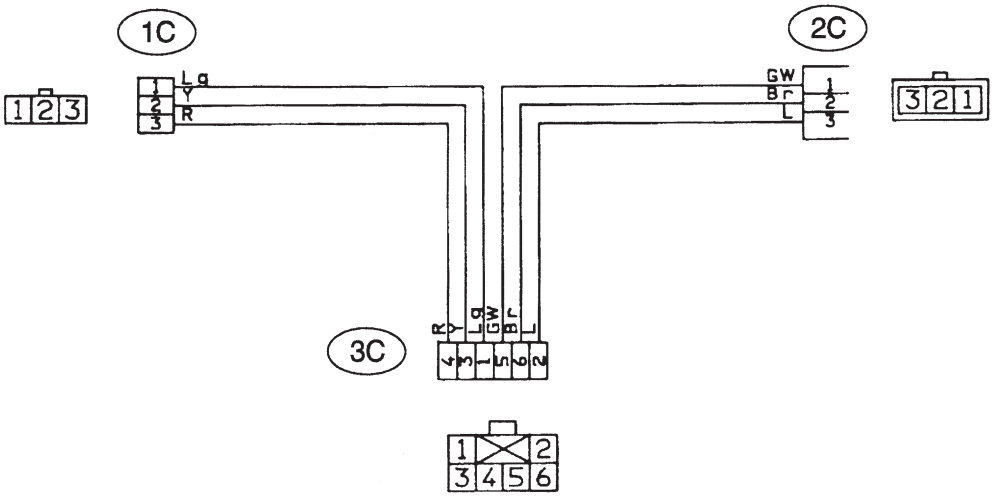


G5M0593

C: TEST HARNESS C

PN 98299PA020



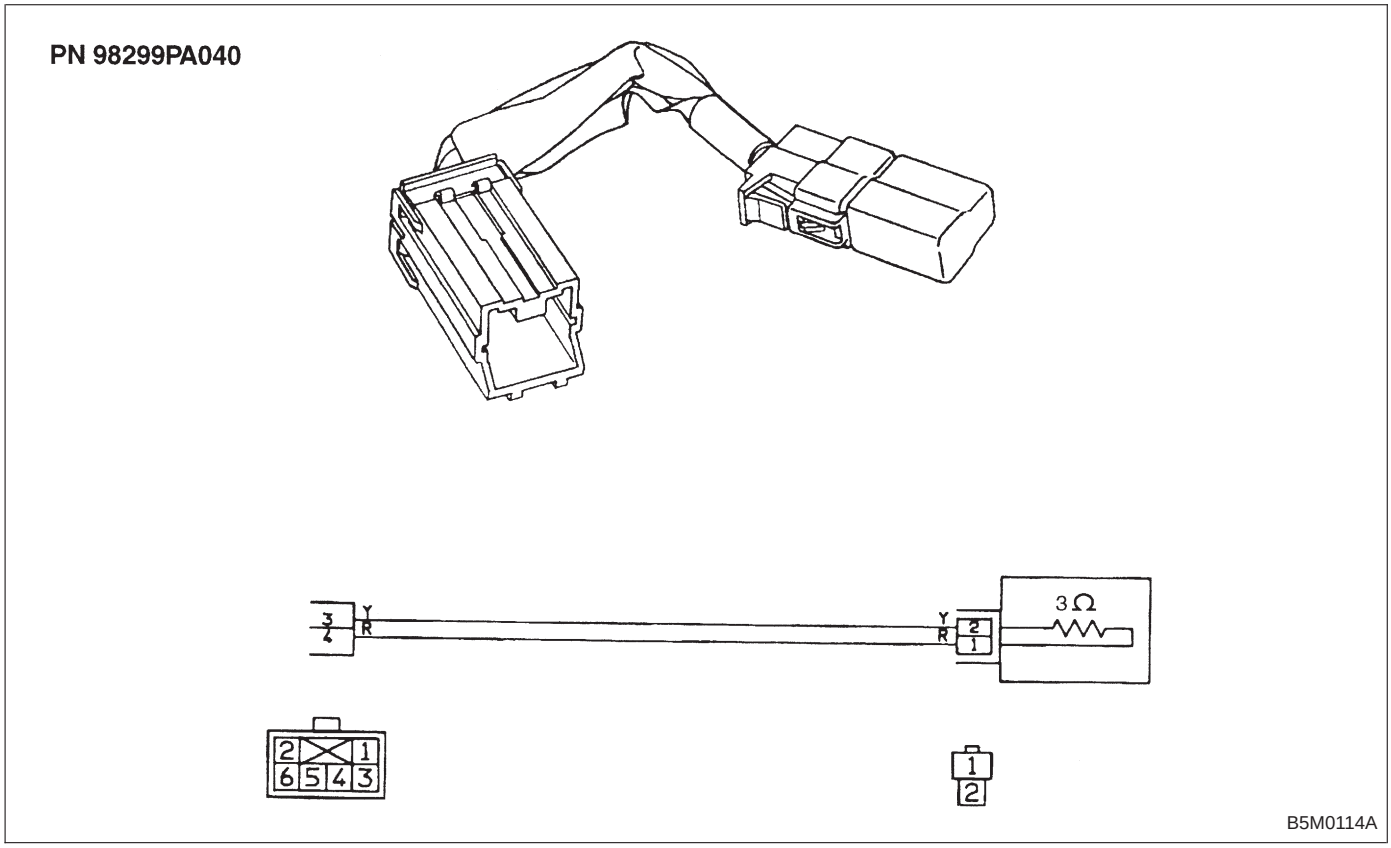


B5M0113A

D: AIRBAG RESISTOR

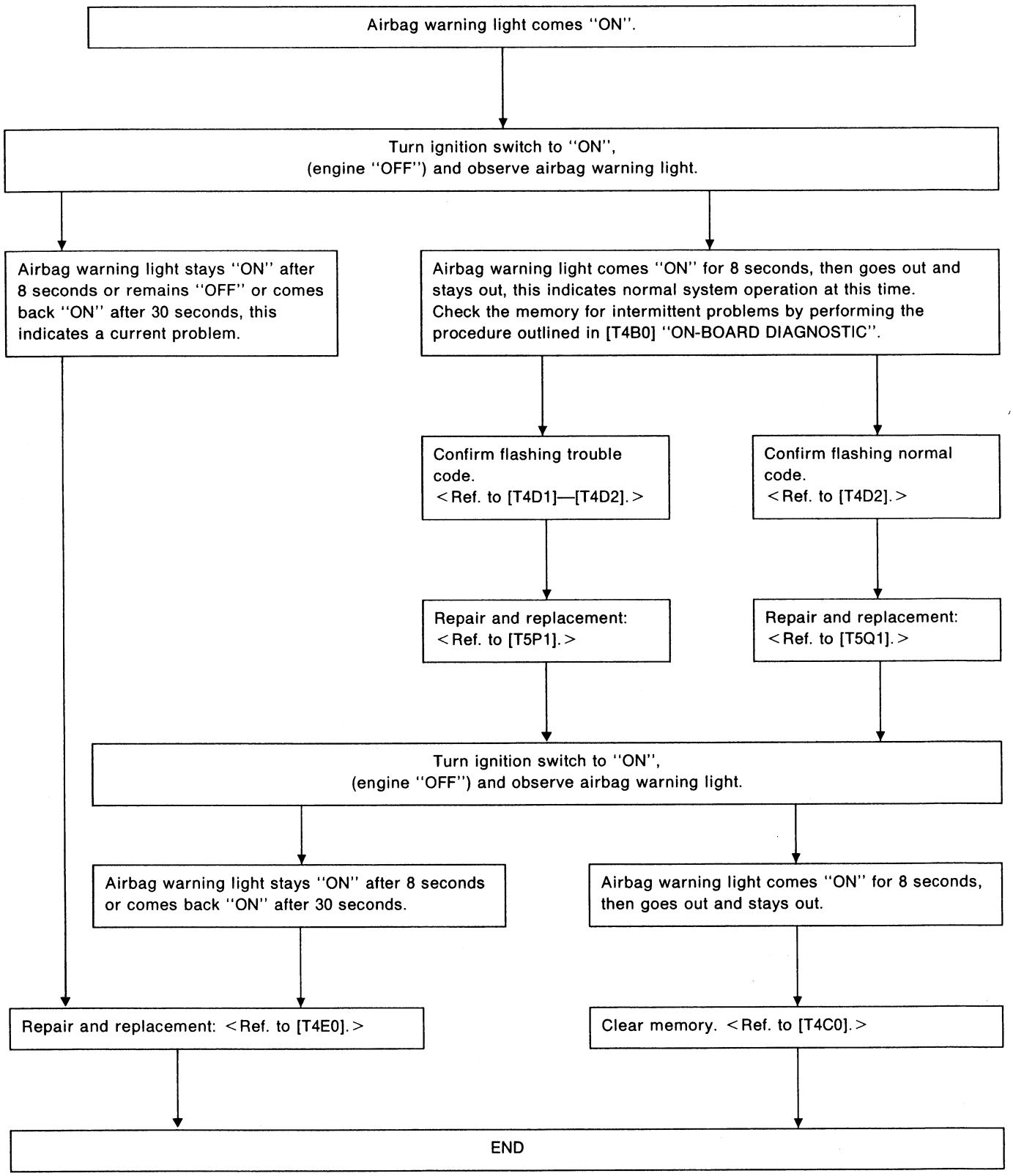
The airbag resistor is used during diagnostics. The airbag resistor has the same resistance as the airbag module and thus provides safety when used instead of the airbag module. It also makes it possible to finish, diagnostics in less time.

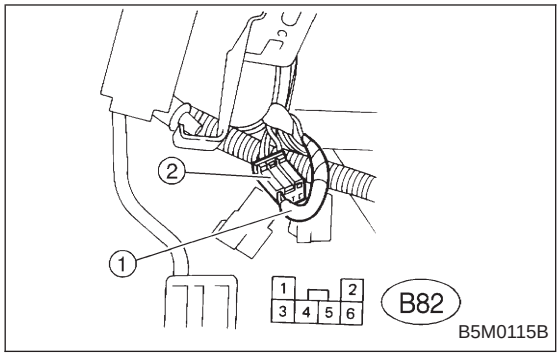
PN 98299PA040



4. Diagnostics Chart for On-board Diagnostic System

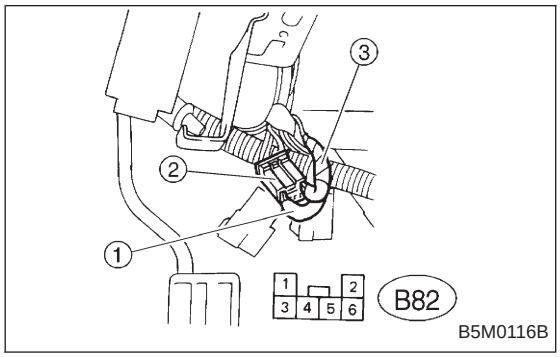
A: BASIC DIAGNOSTICS PROCEDURE





B: ON-BOARD DIAGNOSTIC

When the airbag system is in functioning condition, the airbag warning light will remain on for 8 seconds and go out when the ignition switch is set to ON.
If there is any malfunction, the airbag warning light will either stay on or off continuously. In such cases, perform on-board diagnostic in accordance with the specified procedure to determine trouble codes.
1) Turn ignition switch ON (with engine OFF).
2) Connect DIAG. terminal ① to No. 1 terminal of diagnosis connector ② located below lower cover.
3) Check in accordance with the trouble code indicated by the AIRBAG warning light, and record the trouble codes.
4) Turn the ignition switch “OFF” and remove the DIAG. terminal from No.1 terminal of diagnosis connector.



C: CLEAR MEMORY

After eliminating problem as per trouble code, clear memory as follows:
Make sure ignition switch is ON (and engine off). Connect one DIAG. terminal ① on diagnosis connector ② terminal No. 1.
While warning light is flashing, connect the other DIAG. terminal ③ on terminal No. 2 for at least three seconds.
After memory is cleared, normal warning light flashing rate resumes. (Warning light flashes every 0.6 seconds ON-OFF operation.) Memory cannot be cleared if any problem exists.
After clear memory and then DIAG. terminals ① and ③, extract from diagnosis connector ②.

D: LIST OF TROUBLE CODES

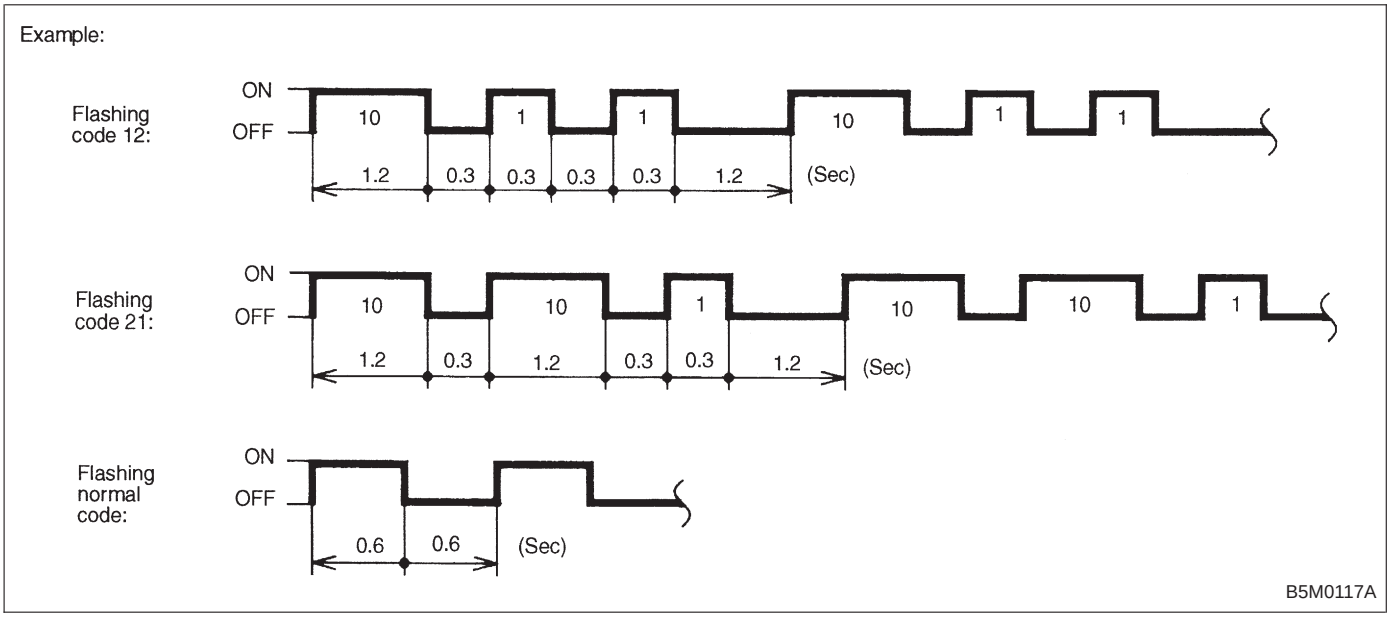
1. TROUBLE CODES

Trouble code/Contents of troubles	Memory function	Contents of diagnosis	Page
02	Provided.	1) Front sensor harness is shorted. 2) Airbag main harness is shorted. 3) Airbag module harness (Dr/Ps) is shorted. 4) Roll connector is shorted. 5) Airbag control module is faulty.	16
03	Provided.	1) Front sensor harness circuit is open. 2) Front sensor unit circuit is open.	18
04	Provided.	1) Airbag main harness circuit is shorted. 2) Airbag module harness (Ps) circuit is shorted. 3) Airbag control module is faulty.	19
11	Provided.	1) Airbag control module is faulty. 2) Airbag main harness circuit is open. 3) Fuse No. 8 is blown. 4) Body harness circuit is open.	20
12	Provided.	1) Airbag main harness circuit is open. 2) Airbag module harness (Dr) circuit is open. 3) Roll connector circuit is open. 4) Airbag control module is faulty.	22
13	Provided.	1) Airbag main harness circuit is shorted. 2) Airbag module harness (Dr) is shorted. 3) Roll connector circuit is shorted. 4) Airbag control module is faulty.	23
14	Not provided.	1) (AB9) and (AB10) are not connected properly. 2) (AB2) and (AB7) are not connected properly. 3) (AB3) and (AB8) are not connected properly. 4) (AB4), (AB5) and (AB6) are not connected properly to airbag control module.	24
21	Provided.	Airbag control module is faulty.	26
22	Provided.	1) Airbag main harness circuit is open. 2) Airbag module harness (Ps) circuit is open. 3) Airbag control module is faulty.	27
23	Provided.	1) Airbag main harness is shorted to power supply. 2) Front sensor harness is shorted to power supply. 3) Airbag module harness (Dr/Ps) is damaged. 4) Roll connector is shorted to power supply. 5) Airbag control module is faulty.	28
24	Provided.	1) Airbag main harness circuit is open. 2) Airbag module harness (Dr) circuit is open. 3) Roll connector circuit is open. 4) Airbag control module is faulty. 5) Above diagnosis plus other faulty of airbag modular parts.	30
31	Not provided.	1) Airbag control module is faulty. 2) Airbag main harness circuit is open. 3) Fuse No. 16 is blown. 4) Body harness circuit is open.	32
32	Provided.	1) Airbag main harness circuit is open. 2) Airbag module harness (Ps) circuit is open. 3) Airbag control module is faulty. 4) Above diagnosis plus other faulty of airbag modular parts.	34
NOTE: Dr: Driver side Ps: Passenger side			

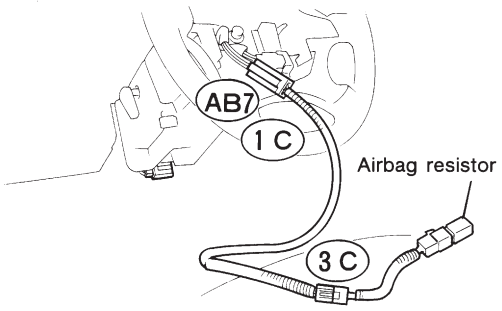
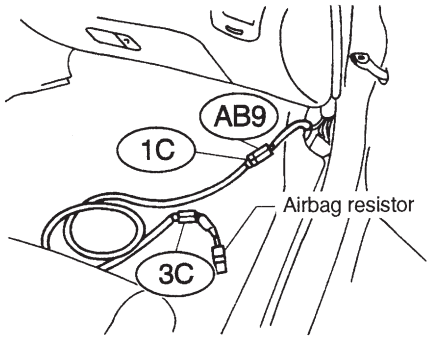
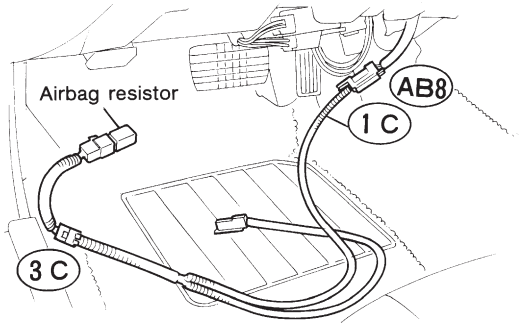
Trouble code/Contents of troubles		Memory function	Contents of diagnosis	Page
Airbag warning light remains on.		Not provided.	1) Airbag warning light is faulty. 2) Airbag control module to airbag warning light harness circuit is shorted or open. 3) Grounding circuit is faulty. 4) Airbag control module is faulty. 5) (AB1) and (B31) are not connected properly.	36
Airbag warning light remains off.		Not provided.	1) Fuse No. 15 is blown. 2) Body harness circuit is open. 3) Airbag warning light is faulty. 4) Airbag main harness is faulty. 5) Airbag control module is faulty.	40
Warning light indicates trouble code, then normal code.	Flashing trouble code.	Provided.	Airbag system component parts are faulty.	42
	Flashing normal code.	Not provided.	1) Airbag connector is faulty. 2) Fuse No. 16 is blown. 3) Airbag main harness is faulty. 4) Airbag control module is faulty. 5) Body harness is faulty.	45

2. HOW TO READ TROUBLE CODES

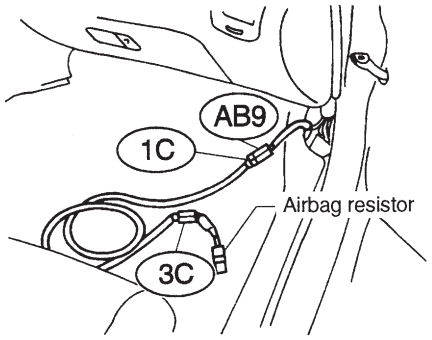
The AIRBAG warning light flashes a code corresponding to the faulty parts.
The long segment (1.2 sec on) indicates a “ten”, and the short segment (0.3 sec on) indicates a “one”.



E: DIAGNOSTICS PROCEDURE

Airbag warning light stays on after 8 seconds.
1) Perform on-board diagnostic. <Ref. to 5-5 [T4B0].>
2) Are trouble codes 2, 4, 12, 13, 22, 23, 24 or 32 indicated? <Ref. to 5-5 [T4D1]—[T4D2].> Record trouble codes.
3) If “NO”, proceed with diagnostics and repair according to trouble code indicated then perform step 29).
4) If “YES”, proceed by turning ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. If codes 12 or 13 are indicated proceed to step 5). If codes 12 or 13 are not indicated proceed to step 6).
5) Remove driver side airbag module and connect test harness C connector (1C) to (AB7). <Ref. to 5-5 [W3A1].> Connect airbag resistor to test harness C connector (3C). Proceed to step 19).  G5M0430
6) If codes 4 or 22 are indicated, proceed to step 7). If codes 4 or 22 are not indicated proceed to step 11).
7) Turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Disconnect passenger side airbag module connector (AB9) to (AB10). <Ref. to 5-5 [W3A2].> Connect test harness C connector (1C) to (AB9). Connect airbag resistor to test harness C connector (3C).  B5M0118A
8) Reconnect battery ground cable and turn ignition switch “ON”, does airbag warning light go out after 8 seconds and remain “OFF” for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.)
9) If “YES”, turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Install a new passenger side airbag module <Ref. to 5-5 [W3B0].> then proceed to step 29).
10) If “NO” proceed to step 1).
11) Remove lower cover panel and connect test harness C connector (1C) to (AB8) <Ref. to 5-4 [W1A0].> with airbag resistor attached to test harness C connector (3C). Turn ignition switch “ON”. Does airbag warning light go “OFF” after 8 seconds and remain off for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.) If “YES” proceed to step 5). If “NO” proceed to step 12).  G5M0429

12) Turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Connect connector (AB3) to (AB8). Disconnect passenger side airbag module connector (AB9) to (AB10). <Ref. to 5-5 [W3A2].>
Connect test harness C connector (1C) to (AB9). Connect airbag resistor to test harness C connector (3C).

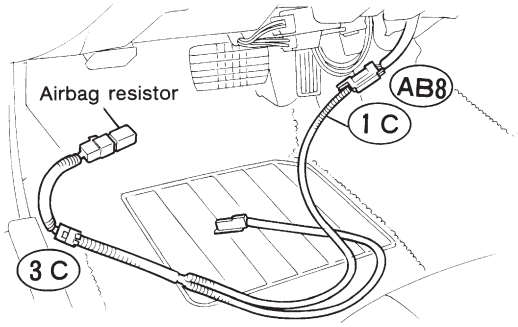


B5M0118A

13) Reconnect battery ground cable and turn ignition switch “ON”. Does airbag warning light go “OFF” after 8 seconds and remain off for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.)

14) If “YES”, proceed to step 9).

15) If “NO”, turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Disconnect connector (AB3) to (AB8). Connect test harness C connector (1C) to (AB8). Connect airbag resistor to test harness C connector (3C).



G5M0429

16) Reconnect battery ground cable and turn ignition switch “ON”. Does airbag warning light go “OFF” after 8 seconds and remain off for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.)

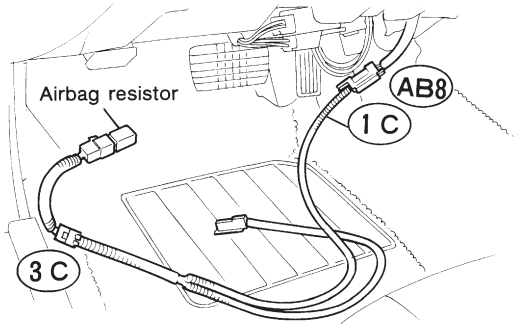
17) If “YES”, turn ignition switch “OFF”, disconnect battery ground cable and wait 20 seconds. Install a new passenger side airbag module <Ref. to 5-5 [W3B0].> then proceed to step 5).

18) If “NO”, proceed with diagnostics according to trouble code indicated during on-board diagnostic. Proceed to step 29).

19) Reconnect battery ground cable and turn ignition switch “ON”, does airbag warning light go out after 8 seconds and remain “OFF” for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.)

20) If “YES”, turn ignition switch “OFF”, disconnect battery ground cable and wait 20 seconds. Install driver side airbag module <Ref. to 5-5 [W3B0].> and proceed to step 29).

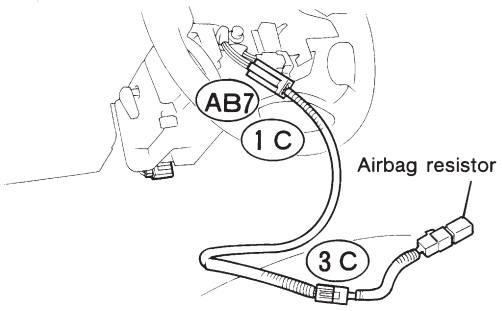
21) If “NO”, remove lower cover panel and connect test harness C connector (1C) to (AB8) <Ref. to 5-4 [W1A0].> with airbag resistor attached to test harness C connector (3C).
Turn ignition switch “ON”. Does airbag warning light go “OFF” after 8 seconds and remain off for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.)
If “YES” proceed to step 22).
If “NO” proceed to step 23).



G5M0429

22) If “YES”, replace combination switch, <Ref. to 5-5 [W7A0].> and proceed to step 26).

23) If “NO”, proceed with diagnostics and repair according to trouble code indicated, then perform step 24).

24) Turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Remove driver side airbag module and connect test harness C connector (1C) to (AB7) <Ref. to 5-5 [W3A1].> with airbag resistor attached to test harness C connector (3C).  G5M0430
25) Reconnect battery ground cable and turn ignition switch “ON”. Does airbag warning light go “OFF” after 8 seconds and remain off for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.) If “YES”, proceed to step 26). If “NO”, proceed to step 27).
26) Turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Install driver side airbag module <Ref. to 5-5 [W3B0].> and proceed to step 27).
27) Replace combination switch, <Ref. to 5-5 [W7A0].> and proceed to step 26).
28) Reconnect battery and turn ignition switch “ON”. Does airbag warning light go off after 8 seconds and remain off for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.) If “YES”, proceed to step 29). If “NO”, proceed to step 31).
29) Perform clear memory procedure. <Ref. to 5-5 [T4C0].>
30) If memory cannot be cleared, another trouble code exists. Return to step 1).
31) Turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Replace driver side airbag module. <Ref. to 5-5 [W3A1].> Proceed to step 28).
NOTES: **1) Always remember to secure the green double locks before turning the ignition switch “ON”.** **2) In some cases the airbag warning light will go “OFF” after 8 seconds but will turn “ON” again within 30 seconds. In this case continue diagnostics with the basic diagnostics procedures or trouble code procedures.**

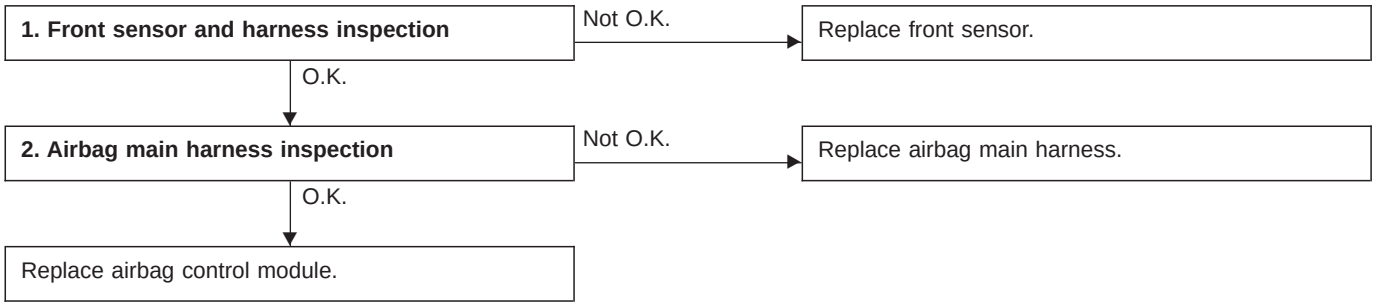
5. Diagnostics Chart with Trouble Code

<Ref. to 5-5 [T4D1].>

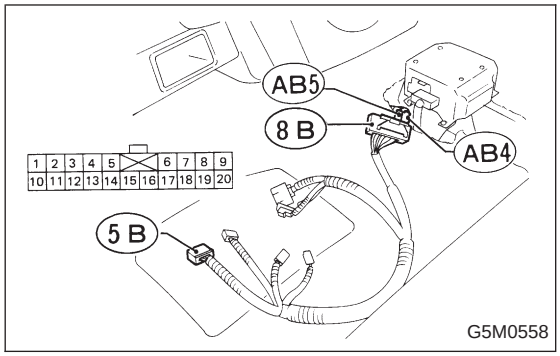
A: TROUBLE CODE 02

DIAGNOSIS:

- Front sensor harness is shorted.
- Airbag main harness is shorted.
- Airbag module harness (Driver or passenger) is shorted.
- Roll connector is shorted.
- Airbag control module is faulty.



CAUTION:
Before performing diagnostics on airbag system, turn ignition switch “OFF”, disconnect battery ground terminal and then wait at least 20 seconds.
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).



1. FRONT SENSOR AND HARNESS INSPECTION

1) Disconnect connectors (AB4) and (AB5) from airbag control module. <Ref. to 5-5 [W6A0].>

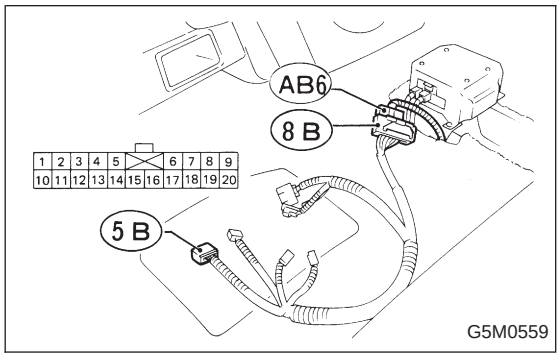
2) Connect connectors (AB4) and (AB5) to connector (8B) of test harness B2.

3) Measure resistance between connector (5B) terminal indicated.

(5B) Terminal / Specified resistance:
(RH: AB4): No. 17 — No. 18 / 1.4 — 1.6 kΩ
(LH: AB5): No. 15 — No. 16 / 1.4 — 1.6 kΩ

4) Measure resistance between each connector (5B) terminal and body.

(5B) Terminal / Specified resistance:
(RH: AB4): No. 17 — Body / 1 MΩ, or more
No. 18 — Body / 1 MΩ, or more
(LH: AB5): No. 15 — Body / 1 MΩ, or more
No. 16 — Body / 1 MΩ, or more



2. AIRBAG MAIN HARNESS INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W6A0].>, and connect (AB6) to test harness B2 connector (8B).

2) Measure resistance between each (5B) terminal and body.

(5B) Terminal / Specified resistance:
No. 1 — Body / 1 MΩ, or more
No. 14 — Body / 1 MΩ, or more

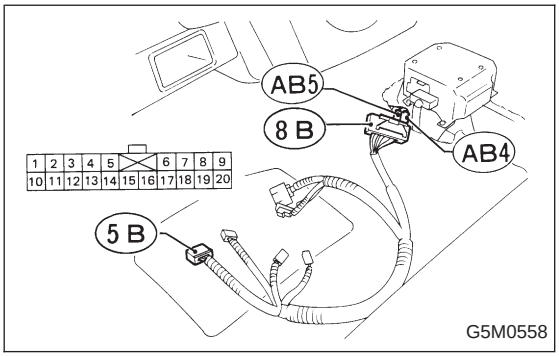
B: TROUBLE CODE 03

DIAGNOSIS:

- Front sensor harness circuit is open.
- Front sensor unit circuit is open.

1. Front sensor (LH and RH) inspection	→ Identify faulty sensor and replace front sensor.

CAUTION:
Before performing the diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal and then wait at least 20 seconds.



1. FRONT SENSOR (LH AND RH) INSPECTION

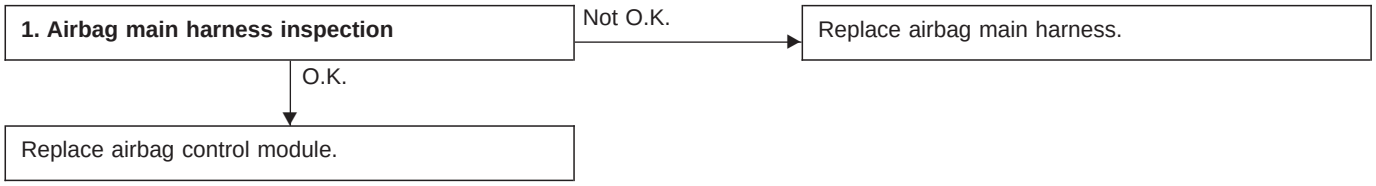
1) Disconnect connectors (AB4) and (AB5) from airbag control module. <Ref. to 5-5 [W6A0].>
2) Connect connectors (AB4) and (AB5) to test harness B2 connector (8B).
3) Measure resistance between connector (5B) terminal.

(5B) Terminal / Specified resistance:
(RH: AB4): No. 17 — No. 18 / 1.4 — 1.6 kΩ
(LH: AB5): No. 15 — No. 16 / 1.4 — 1.6 kΩ

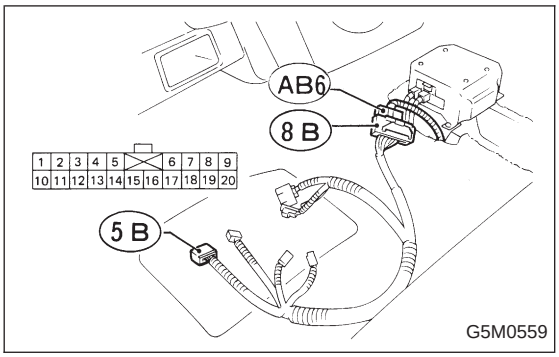
C: TROUBLE CODE 04

DIAGNOSIS:

- Airbag main harness circuit is shorted.
- Airbag module harness (Passenger) circuit is shorted.
- Airbag control module is faulty.



CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).



1. AIRBAG MAIN HARNESS INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W6A0].>, and connect it to test harness B2 connector (8B).

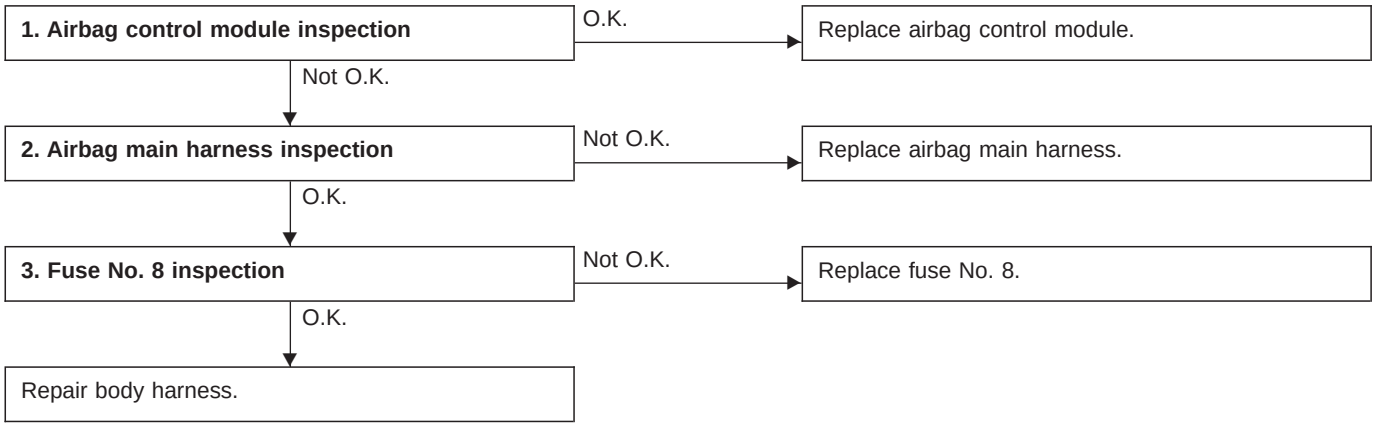
2) Measure resistance between test harness B2 connector (5B) terminal.

(5B) Terminal / Specified resistance:
No. 6 — No. 7 / 10 kΩ, or more

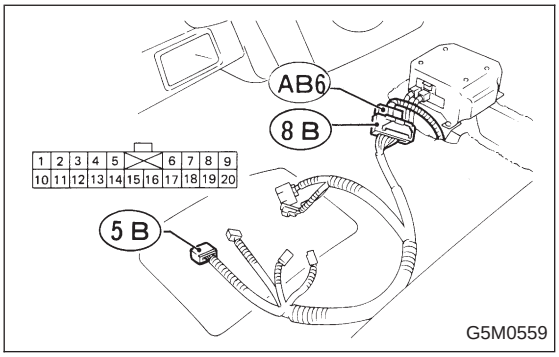
D: TROUBLE CODE 11

DIAGNOSIS:

- Airbag control module is faulty.
- Airbag main harness circuit is open.
- Fuse No. 8 is blown.
- Body harness circuit is open.



CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).



1. AIRBAG CONTROL MODULE INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W6A0].> and connect it to test harness B2 connector (8B).

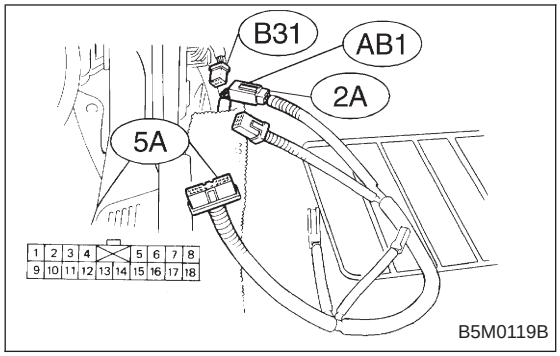
2) Connect battery ground cable and turn ignition switch "ON". (engine off)

3) Measure voltage across connector (5B) terminal and body.

(5B) Terminal / Specified voltage:
No. 2 — Body / 10 V, or more

2. AIRBAG MAIN HARNESS INSPECTION

1) Go to step 2) below after performing diagnostics on airbag system as per flowchart under **"1. AIRBAG CONTROL MODULE INSPECTION"** previously outlined.
2) Turn ignition switch "OFF", disconnect battery ground terminal and then wait at least 20 seconds.



3) Disconnect body harness connector (B31) from connector (AB1) at front lower pillar, and connect connector (AB1) to test harness A connector (2A).

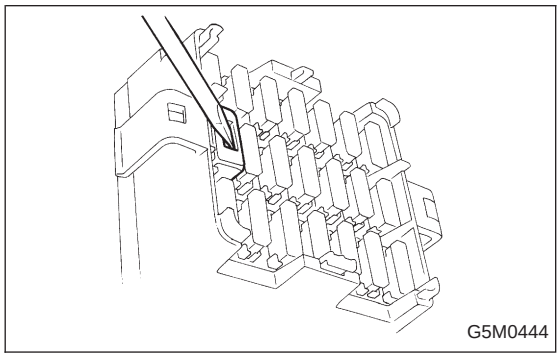
4) Measure resistance between test harness A connector (5A) terminal and test harness B2 connector (5B) terminal.

Connector & terminal / Specified resistance:
(5A) No. 1 — (5B) No. 2 / 10 Ω, or less

5) Measure resistance between terminals of connectors (5A) and (5B).

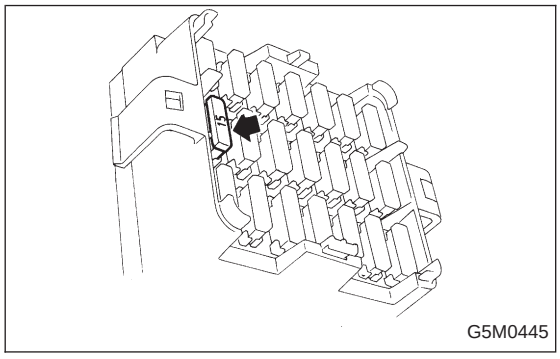
(5A) Terminal / Specified resistance:
No. 1 — Body / 10 kΩ, or more

(5B) Terminal / Specified resistance:
No. 2 — Body / 10 kΩ, or more



3. FUSE No. 8 INSPECTION

1) Turn ignition switch “OFF”, and remove airbag fuse protector.

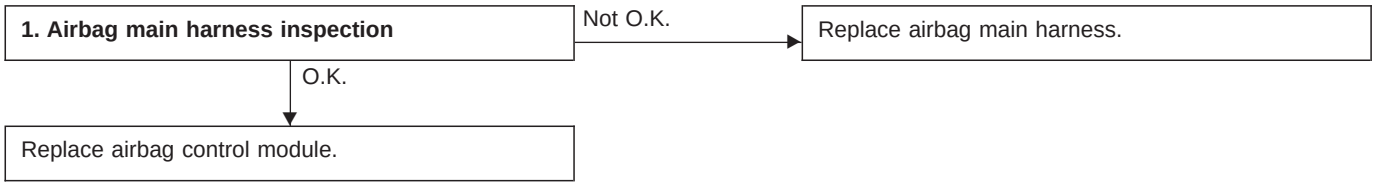


2) Remove and visually check fuse No. 8.

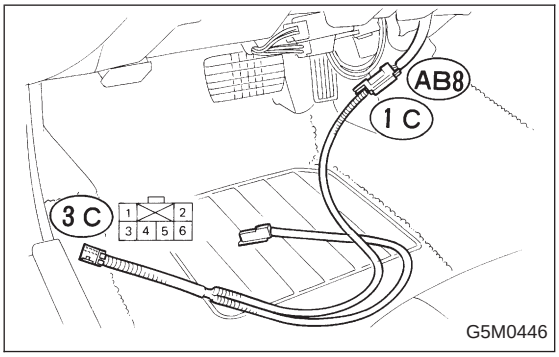
E: TROUBLE CODE 12

DIAGNOSIS:

- Airbag main harness circuit is open.
- Airbag module harness (Driver) circuit is open.
- Roll connector circuit is open.
- Airbag control module is faulty.

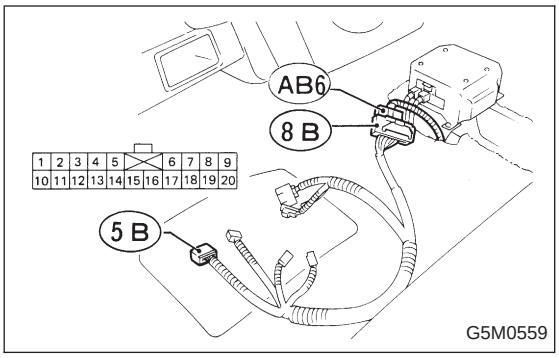


CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.



1. AIRBAG MAIN HARNESS INSPECTION

1) Remove lower cover panel <Ref. to 5-4 [W1A0].>, and connect connector (AB8) below steering column to test harness C connector (1C).



2) Disconnect connector (AB6) <Ref. to 5-5 [W6A0].> from airbag control module, and connect it to test harness B2 connector (8B) terminal.

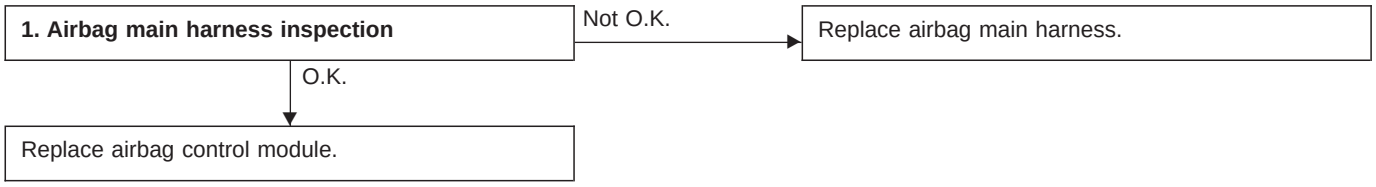
3) Measure resistance between test harness B2 connector (5B) and test harness C connector (3C) terminals.

Connector & terminal / Specified resistance:
(5B) No. 14 — (3C) No. 4 / 10 Ω, or less
(5B) No. 1 — (3C) No. 3 / 10 Ω, or less

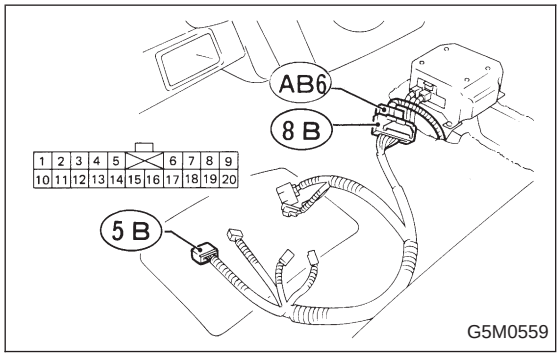
F: TROUBLE CODE 13

DIAGNOSIS:

- Airbag main harness circuit is shorted.
- Airbag module harness (Driver) is shorted.
- Roll connector circuit is shorted.
- Airbag control module is faulty.



CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).



1. AIRBAG MAIN HARNESS INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W6A0].>, and connect it to test harness B2 connector (8B).

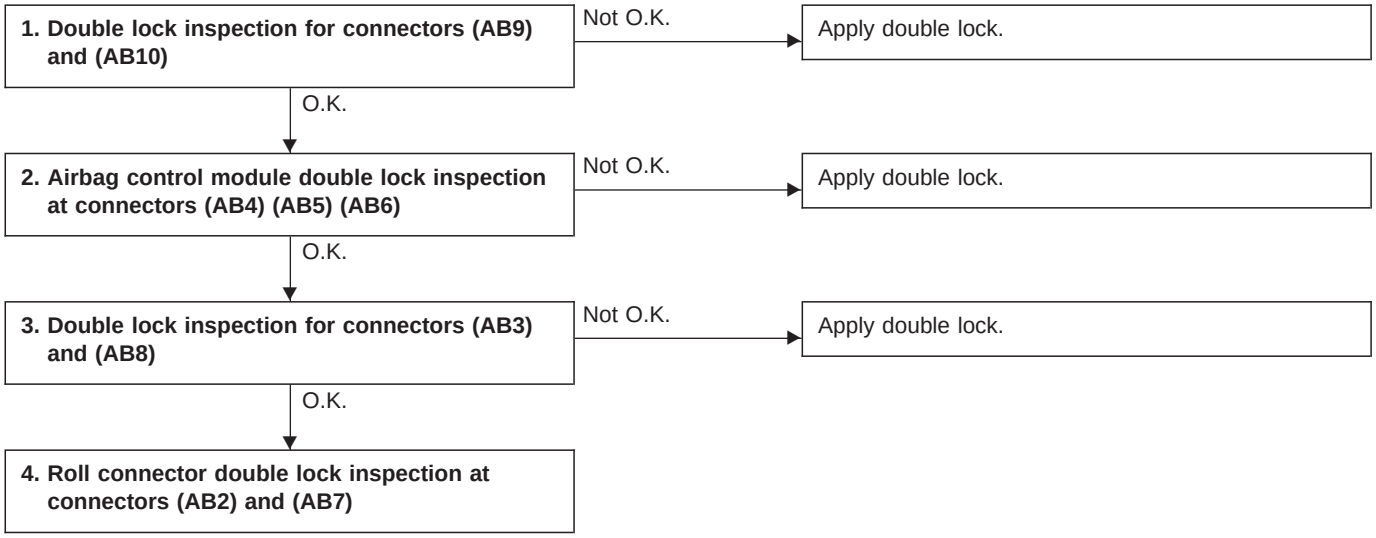
2) Measure resistance between test harness B2 connector (5B) terminal.

(5B) Terminal / Specified resistance:
No. 1 — No. 14 / 10 kΩ, or more

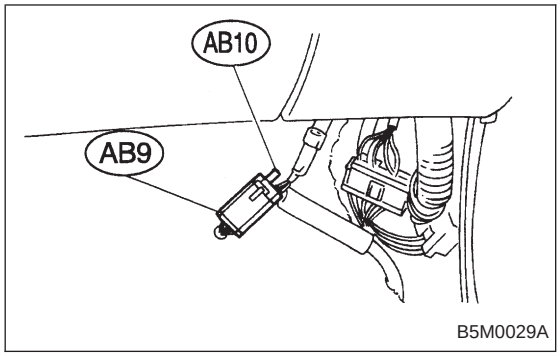
G: TROUBLE CODE 14

DIAGNOSIS:

- (AB9) and (AB10) are not connected properly.
- (AB2) and (AB7) are not connected properly.
- (AB3) and (AB8) are not connected properly.
- (AB4), (AB5) and (AB6) are not connected properly to airbag control module.

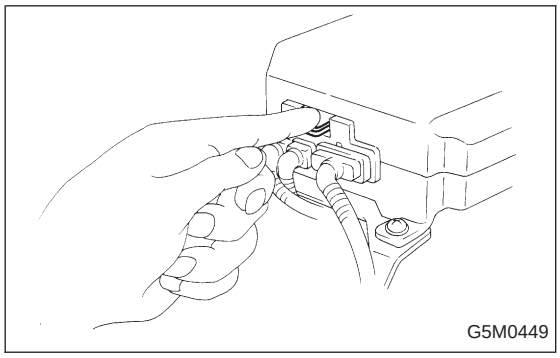


CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.



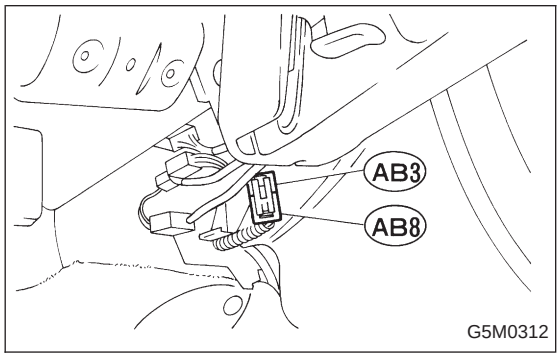
1. DOUBLE LOCK INSPECTION FOR CONNECTORS (AB9) AND (AB10)

1) Remove front pillar lower trim (Passenger side). <Ref. to 5-3 [W5A1].>
2) Check double lock of connectors (AB9) and (AB10).



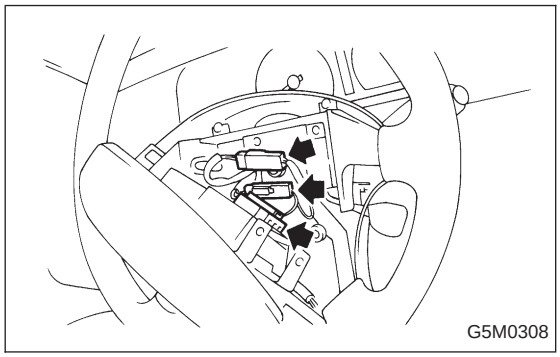
2. AIRBAG CONTROL MODULE DOUBLE LOCK INSPECTION AT CONNECTORS (AB4) (AB5) (AB6)

Check double lock of connectors (AB4) (AB5) (AB6) connected to airbag control module. <Ref. to 5-5 [W6A0].>



3. DOUBLE LOCK INSPECTION FOR CONNECTORS (AB3) AND (AB8)

1) Remove lower cover panel. <Ref. to 5-4 [W1A0].>
2) Check double lock of connectors (AB3) and (AB8) below steering column.



4. ROLL CONNECTOR DOUBLE LOCK INSPECTION AT CONNECTORS (AB2) AND (AB7)

Remove driver side airbag module <Ref. to 5-5 [W3A1].>, and check double lock of connectors (AB2) and (AB7) at roll connector.

H: TROUBLE CODE 21

DIAGNOSIS:

- Airbag control module is faulty.

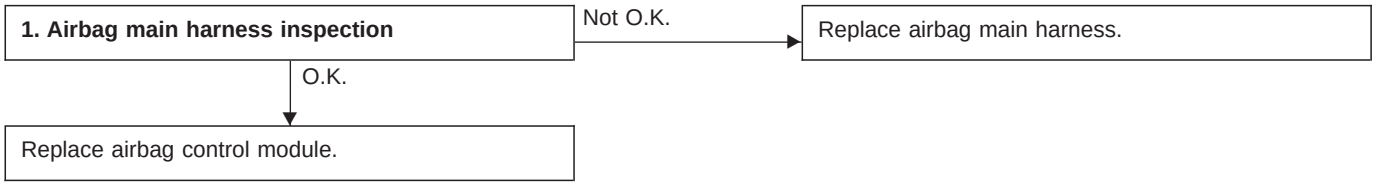
Replace airbag control module.

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch “OFF”, disconnect battery ground terminal, and then wait at least 20 seconds. <Ref. to 5-5 [W6A0].>

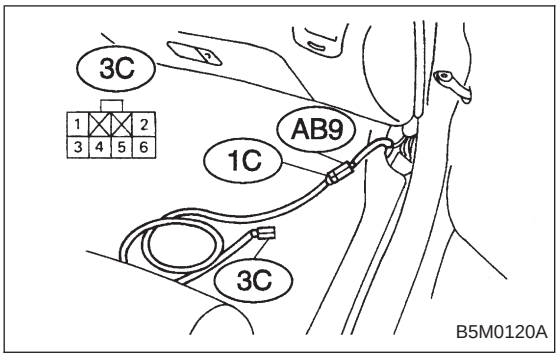
I: TROUBLE CODE 22

DIAGNOSIS:

- Airbag main harness circuit is open.
- Airbag module harness (Passenger) circuit is open.
- Airbag control module is faulty.

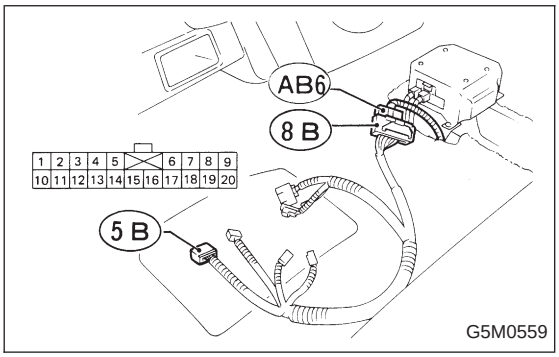


CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.



1. AIRBAG MAIN HARNESS INSPECTION

1) Remove front pillar lower trim (Passenger side). <Ref. to 5-3 [W5A1].>, disconnect connector (AB9) and (AB10) and connect connector (AB9) to test harness C connector (1C).



2) Disconnect connector (AB6) <Ref. to 5-5 [W6A0].> from airbag control module, and connect it to test harness B2 connector (8B) terminal.

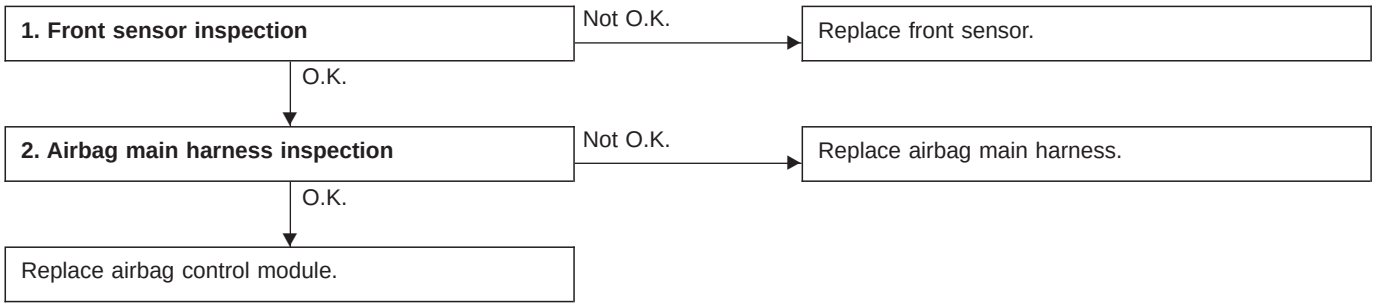
3) Measure resistance between test harness B2 connector (5B) and test harness C connector (3C) terminals.

Connector & terminal / Specified resistance:
(5B) No. 6 — (3C) No. 4 / 10 Ω, or less
(5B) No. 7 — (3C) No. 3 / 10 Ω, or less

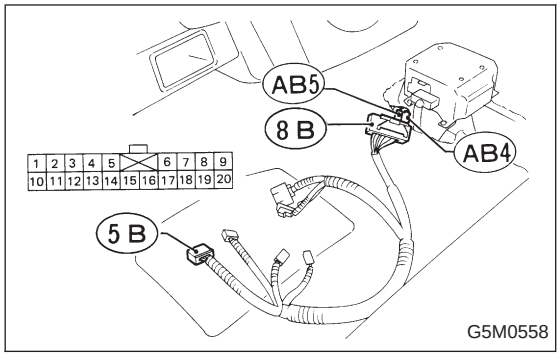
J: TROUBLE CODE 23

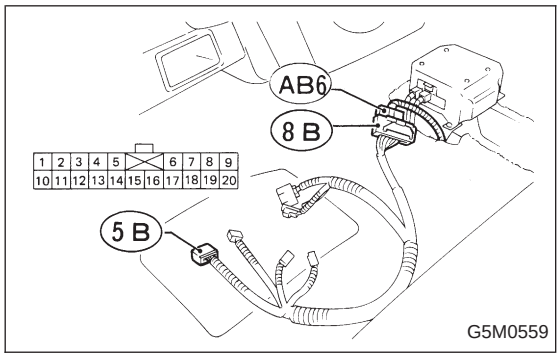
DIAGNOSIS:

- Airbag main harness is shorted to power supply.
- Front sensor harness is shorted to power supply.
- Airbag module harness (Driver or passenger) is damaged.
- Roll connector is shorted to power supply.
- Airbag control module is faulty.



CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal and then wait at least 20 seconds.
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).





1. FRONT SENSOR INSPECTION

1) Disconnect connectors (AB4) and (AB5) from airbag control module. <Ref. to 5-5 [W6A0].>
2) Connect connectors (AB4) and (AB5) to test harness B2 connector (8B).

3) Measure resistance between test harness B2 connector (5B) terminal.

(5B) Terminal / Specified resistance:
(RH: AB4): No. 17 — No. 18 / 1.4 — 1.6 kΩ
(LH: AB5): No. 15 — No. 16 / 1.4 — 1.6 kΩ

2. AIRBAG MAIN HARNESS INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W6A0].>, and connect it to test harness B2 connector (8B).

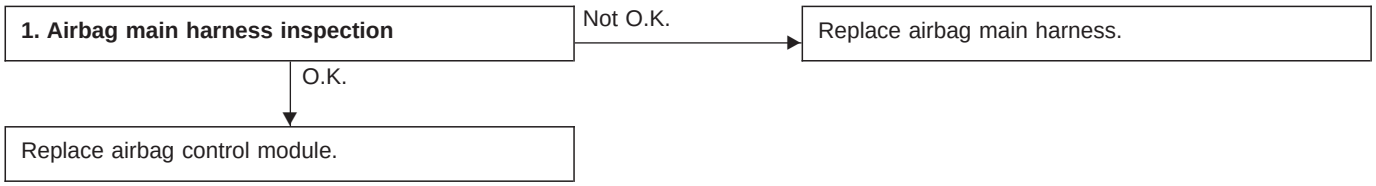
2) Connect battery ground cable and turn ignition switch “ON” (engine off).
3) Measure voltage across each test harness B2 connector (5B) terminal and body.

(5B) Terminal / Specified voltage:
No. 1 — Body / 1 V, or less
No. 6 — Body / 1 V, or less
No. 7 — Body / 1 V, or less
No. 14 — Body / 1 V, or less

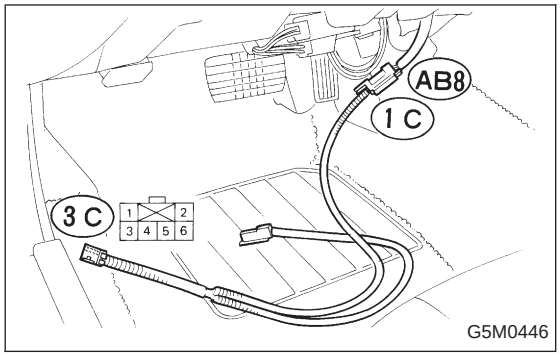
K: TROUBLE CODE 24

DIAGNOSIS:

- Airbag main harness circuit is open.
- Airbag module harness (Driver) circuit is open.
- Roll connector circuit is open.
- Airbag control module is faulty.
- Above diagnosis plus other faulty of airbag modular parts

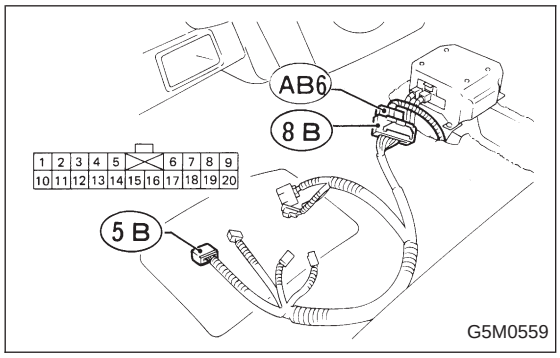


CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.



1. AIRBAG MAIN HARNESS INSPECTION

1) Remove lower cover panel <Ref. to 5-4 [W1A0].>, and connect connector (AB8) below steering column to test harness C connector (1C).



2) Disconnect connector (AB6) <Ref. to 5-5 [W6A0].> from airbag control module, and connect it to test harness B2 connector (8B) terminal.

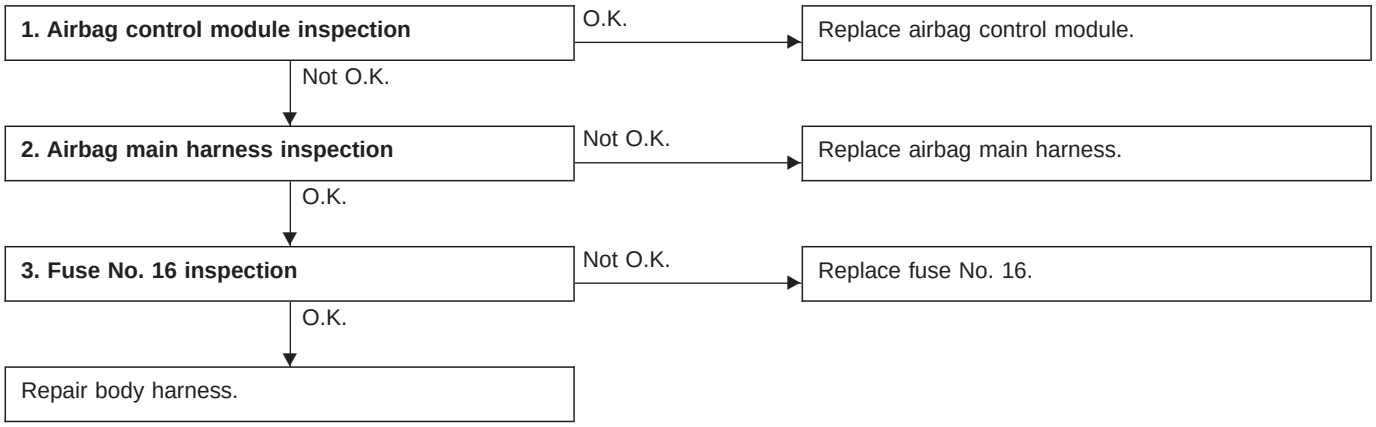
3) Measure resistance between test harness B2 connector (5B) and test harness C connector (3C) terminals.

Connector & terminal / Specified resistance:
(5B) No. 14 — (3C) No. 4 / 10 Ω, or less
(5B) No. 1 — (3C) No. 3 / 10 Ω, or less

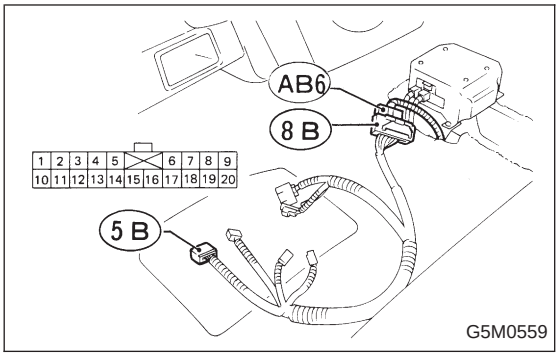
L: TROUBLE CODE 31

DIAGNOSIS:

- Airbag control module is faulty.
- Airbag main harness circuit is open.
- Fuse No. 16 is blown.
- Body harness circuit is open.



CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).



1. AIRBAG CONTROL MODULE INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W6A0].>, and connect it to test harness B2 connector (8B).

2) Connect battery ground cable and turn ignition switch "ON" (engine off).

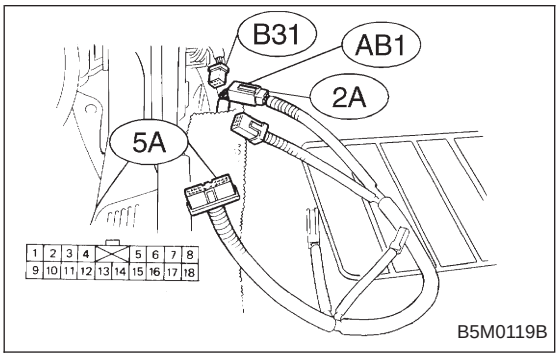
3) Measure voltage across connector (5B) terminal and body.

(5B) Terminal / Specified voltage:
No. 5 — Body / 10 V, or more

2. AIRBAG MAIN HARNESS INSPECTION

1) Go to step 2) below after performing diagnostics on airbag system as per flowchart under **"1. AIRBAG CONTROL MODULE INSPECTION"** previously outlined.

2) Turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.



3) Disconnect connector (AB1) from body harness connector (B31) at front lower pillar, and connect connector (AB1) to test harness A connector (2A).

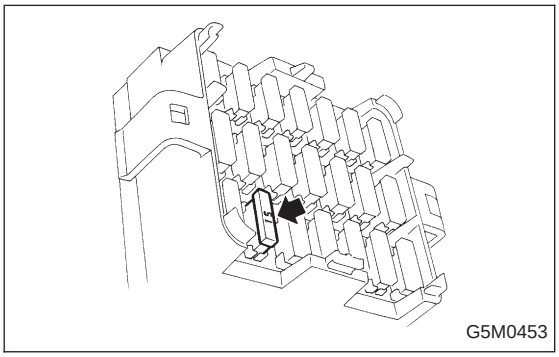
4) Measure resistance between test harness A connector (5A) and test harness B2 connector (5B) terminals.

Connector & terminal / Specified resistance:
(5A) No. 9 — (5B) No. 5 / 10 Ω, or less

5) Measure resistance between each terminal of connectors (5A) and (5B) and body.

(5A) Terminal / Specified resistance:
No. 9 — Body / 10 kΩ, or more

(5B) Terminal / Specified resistance:
No. 5 — Body / 10 kΩ, or more



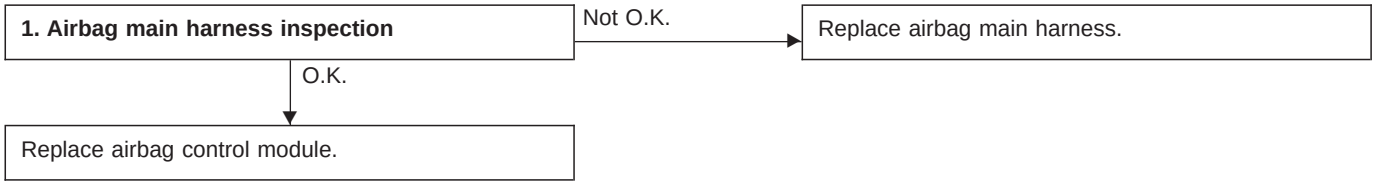
3. FUSE No. 16 INSPECTION

Make sure ignition switch is turned "OFF", then remove and visually check fuse No. 16.

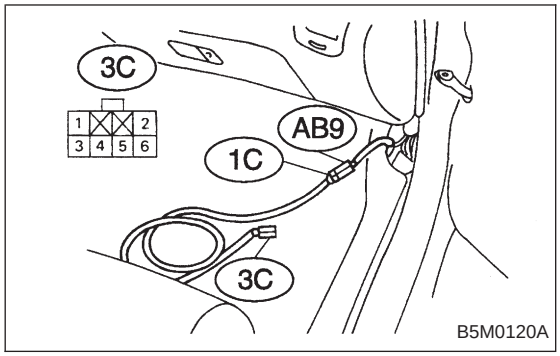
M: TROUBLE CODE 32

DIAGNOSIS:

- Airbag main harness circuit is open.
- Airbag module harness (Passenger) circuit is open.
- Airbag control module is faulty.
- Above diagnosis plus other faulty of airbag modular parts

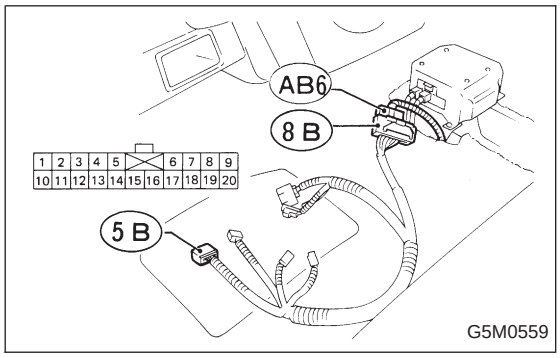


CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.



1. AIRBAG MAIN HARNESS INSPECTION

1) Remove front pillar lower trim (Passenger side). <Ref. to 5-3 [W5A1].>, disconnect connector (AB9) and (AB10) and connect connector (AB9) to test harness C connector (1C).



2) Disconnect connector (AB6) <Ref. to 5-5 [W6A0].> from airbag control module, and connect it to test harness B2 connector (8B) terminal.

3) Measure resistance between test harness B2 connector (5B) and test harness C connector (3C) terminals.

Connector & terminal / Specified resistance:

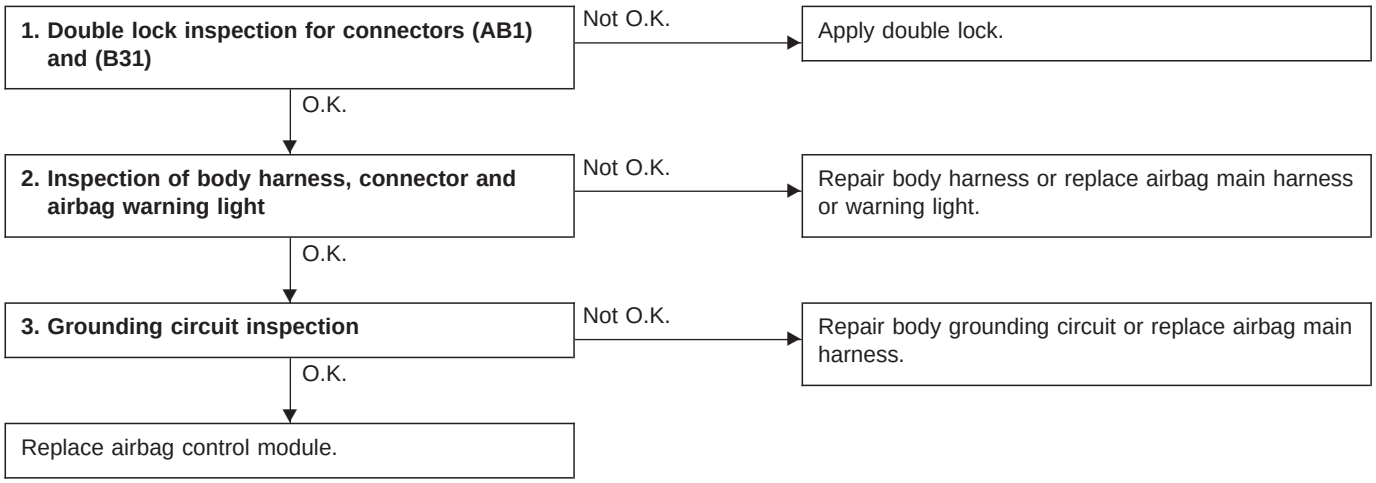
(5B) No. 6 — (3C) No. 4 / 10 Ω, or less

(5B) No. 7 — (3C) No. 3 / 10 Ω, or less

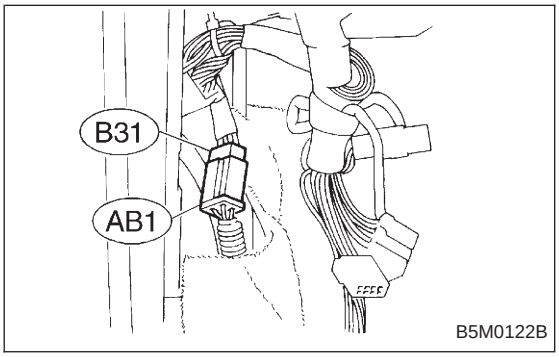
N: AIRBAG WARNING LIGHT REMAINS ON.

DIAGNOSIS:

- Airbag warning light is faulty.
- Airbag control module to airbag warning light harness circuit is shorted or open.
- Grounding circuit is faulty.
- Airbag control module is faulty.
- (AB1) and (B31) are not connected properly.

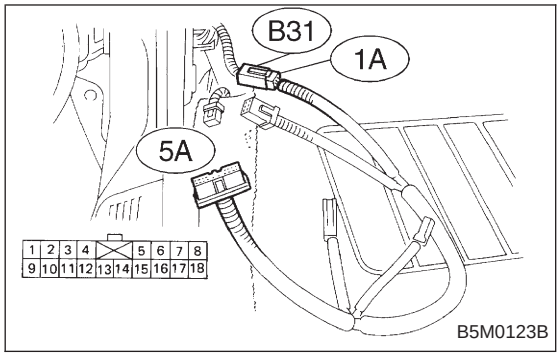


CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.



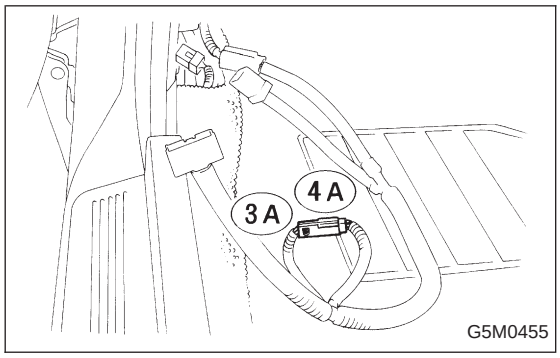
1. DOUBLE LOCK INSPECTION FOR CONNECTORS (AB1) AND (B31)

1) Remove front pillar lower trim (Driver side).
2) Check double lock of connectors (AB1) and (B31).

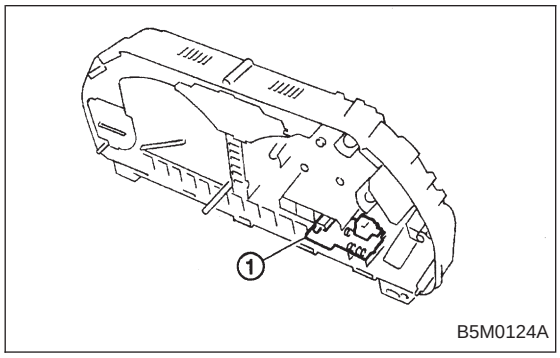


2. INSPECTION OF BODY HARNESS, CONNECTOR AND AIRBAG WARNING LIGHT

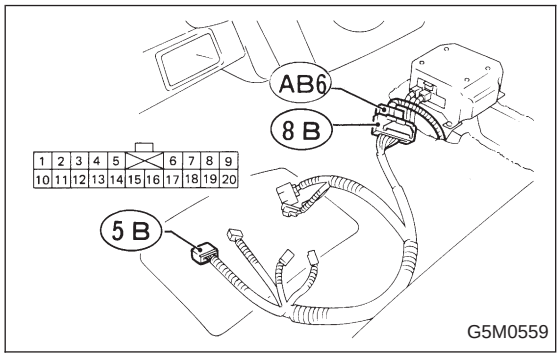
1) Turn ignition switch “OFF” and connect body harness connector (B31) to test connector A connector (1A).



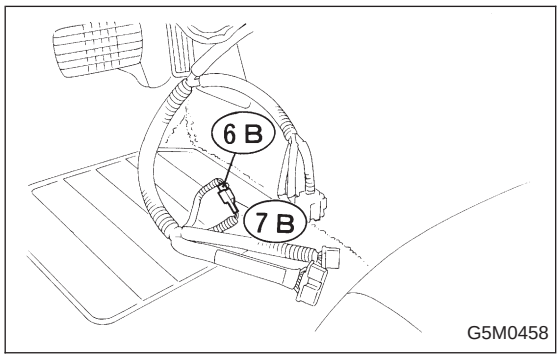
2) Connect battery ground cable and turn ignition switch “ON”, (engine off) and connect connectors (3A) and (4A) to check if warning light goes out. If it does, go to step 4) below. If it remains on, check body harness and repair if necessary.



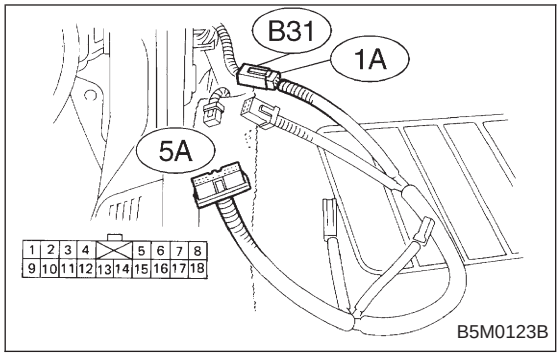
3) If body harness is satisfactory, replace airbag warning light module ①. After problem has been eliminated, disconnect connectors (3A) and (4A).

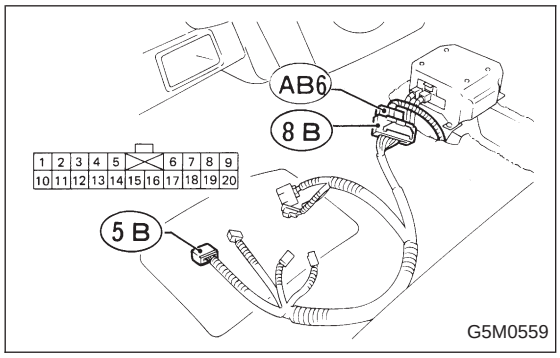


4) Turn ignition switch “OFF”, disconnect battery ground cable and then wait at least 20 seconds, and re-connect connectors (AB1) and (B31).
5) Remove instrument panel lower cover and disconnect (AB3) with (AB8), then disconnect connector (AB6) from airbag control module, <Ref. to 5-5 [W6A0].> and connect it to test harness B2 connector (8B).



6) Connect battery ground cable and turn ignition switch “ON,” (engine off) and connect connectors (6B) and (7B) to check if warning light goes out. If it does, go to **“3. GROUNDING CIRCUIT INSPECTION”**. If it remains on, replace airbag main harness. After problem has been eliminated, disconnect connectors (6B) and (7B).





3. GROUNDING CIRCUIT INSPECTION

1) Turn ignition switch “OFF”, disconnect battery ground cable and then wait at least 20 seconds. Disconnect connector (AB1) from body harness connector (B31), and connect connector (B31) to test harness A connector (1A). Measure resistance between connector (5A) terminal and body.

(5A) Terminal / Specified resistance:
No. 17 — Body / 10 Ω, or less
No. 18 — Body / 10 Ω, or less

If resistance is greater than 10 ohms, body grounding circuit is faulty and should be repaired. If resistance is less than 10 ohms, go to step 2) below.

2) Connect connectors (AB1) and (B31). Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W6A0].>, and connect it to test harness B2 connector (8B).

3) Measure resistance between each test harness B2 connector (5B) terminal and body.

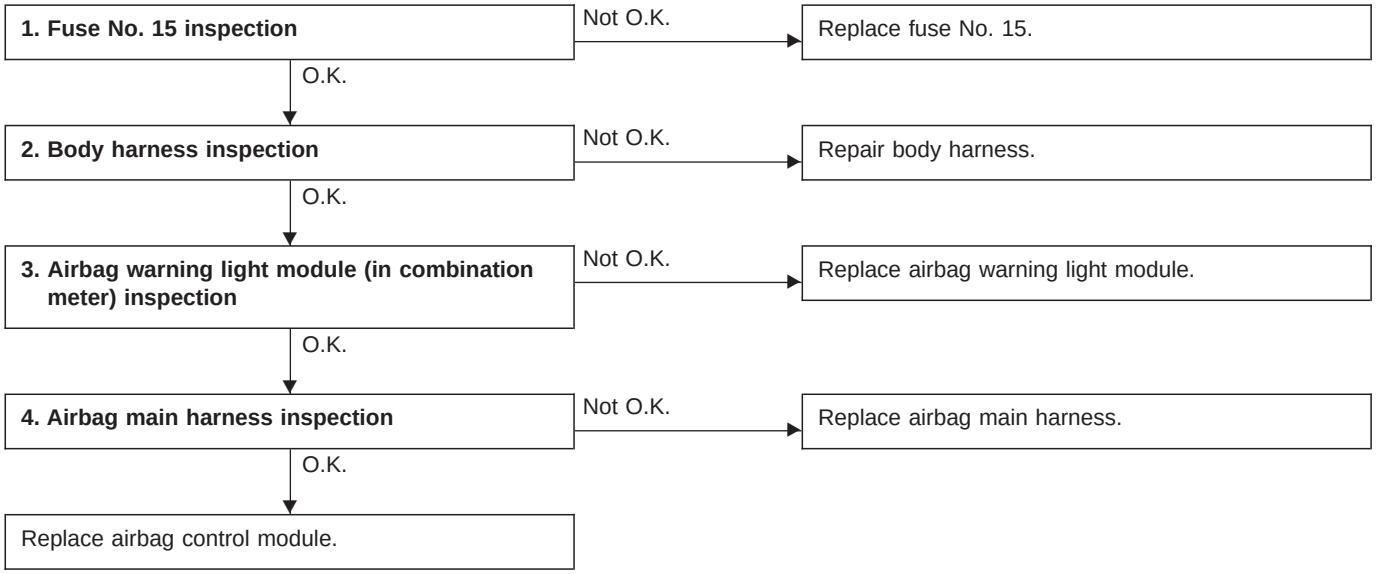
(5B) Terminal / Specified resistance:
No. 11 — Body / 10 Ω, or less
No. 12 — Body / 10 Ω, or less

If resistance is greater than 10 ohms, replace airbag main harness.
If resistance is less than 10 ohms, replace airbag control module.

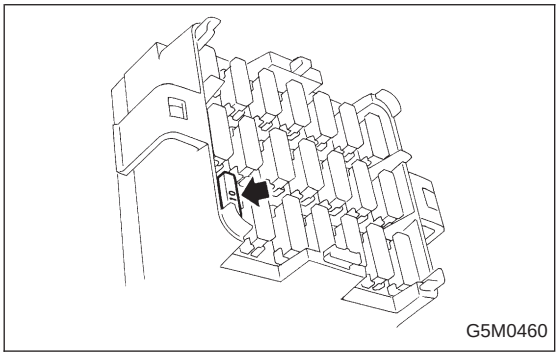
O: AIRBAG WARNING LIGHT REMAINS OFF.

DIAGNOSIS:

- Fuse No. 15 is blown.
- Body harness circuit is open.
- Airbag warning light is faulty.
- Airbag main harness is faulty.
- Airbag control module is faulty.



CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal, and then wait at least 20 seconds.



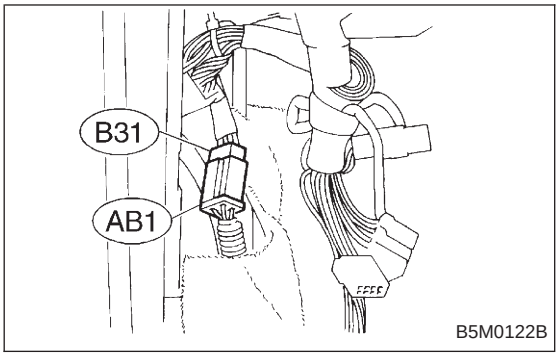
1. FUSE No. 15 INSPECTION

1) Remove and visually check fuse No. 15.

2) If fuse is blown, replace it with a new one. After connecting battery cable and turning ignition switch "ON", if it blows again, proceed to **"2. BODY HARNESS INSPECTION"**.

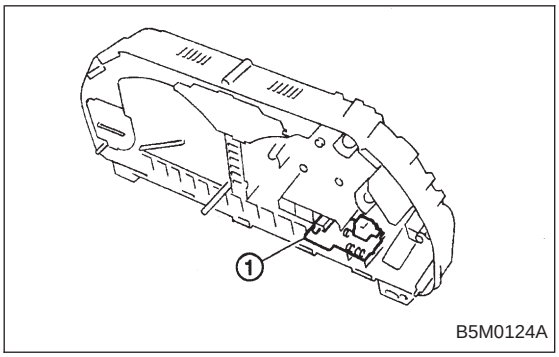
2. BODY HARNESS INSPECTION

Turn ignition switch "ON" (engine off) to make sure other warning lights (in combination meter) illuminate. If they do not, check body harness.

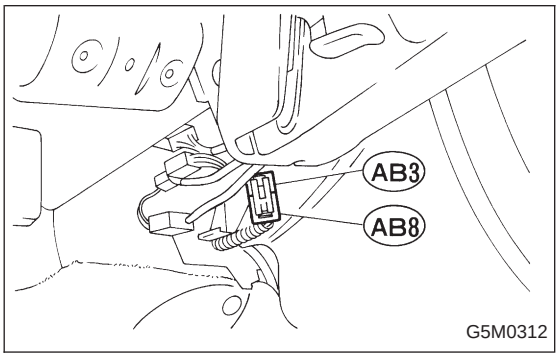


3. AIRBAG WARNING LIGHT MODULE (IN COMBINATION METER) INSPECTION

1) Turn ignition switch “OFF”, disconnect battery ground cable and then wait at least 20 seconds.
2) Disconnect body harness connector (B31) from connector (AB1).

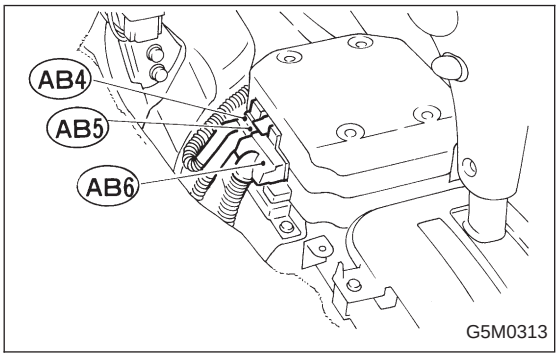


3) Connect battery ground cable and turn ignition switch “ON” (engine off) to make sure airbag warning light illuminates.
If it does not, replace airbag warning light module ①.



4. AIRBAG MAIN HARNESS INSPECTION

1) Turn ignition switch “OFF”, disconnect battery ground cable and then wait at least 20 seconds.
2) Connect body harness connector (B31) and connector (AB1).
3) Disconnect connectors (AB3) and (AB8) below steering column. <Ref. to 5-5 [M2-6].>



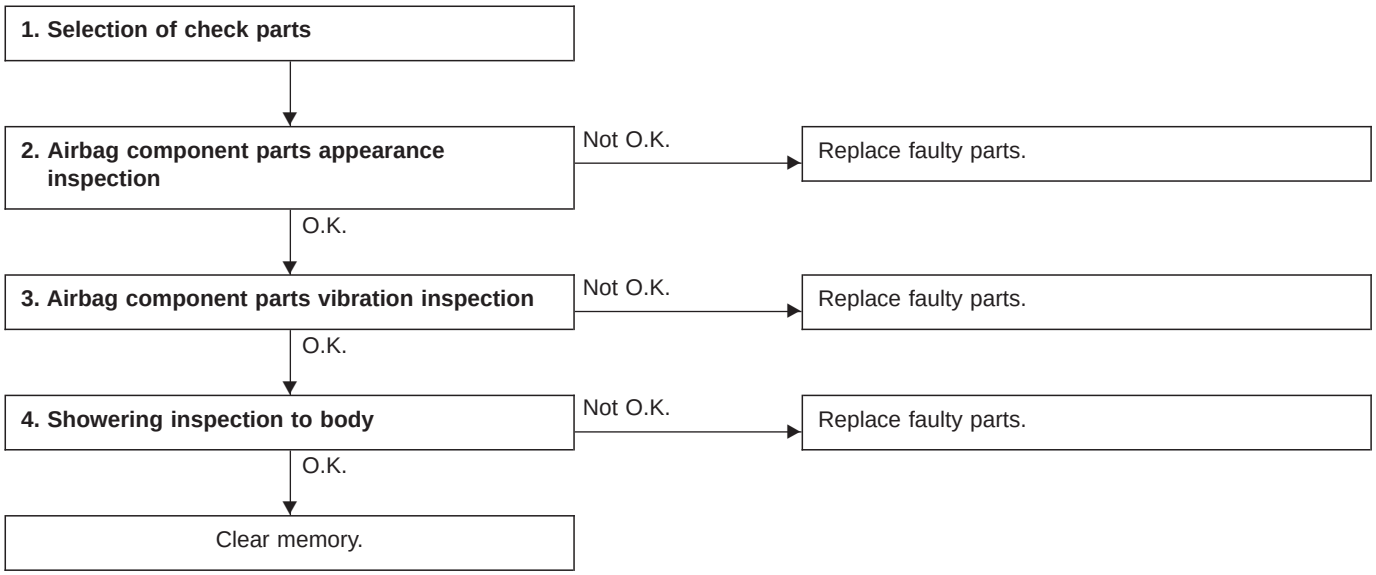
4) Disconnect connector (AB6) from airbag control module. <Ref. to 5-5 [W6A0].>

5) Connect battery ground cable and turn ignition switch “ON” to make sure airbag warning light illuminates.

P: WARNING LIGHT INDICATES TROUBLE CODE, THEN NORMAL CODE. — FLASHING TROUBLE CODE. —

DIAGNOSIS:

- Airbag system component parts are faulty.



CAUTION:
Before performing diagnostics on airbag system, turn ignition switch “OFF”, disconnect battery ground cable, and then wait at least 20 seconds.

1. SELECTION OF CHECK PARTS

1) Conduct on-board diagnostic and call up trouble codes stored in memory. <Ref. to 5-5 [T4B0].>

2) Select trouble code required to check airbag component parts from those listed in table and reproduce symptom.

Trouble codes	Check parts	Refer to 5-5:
02	● Front sensor (RH, LH) ● Airbag main harness ● Airbag module (Driver/Passenger) ● Roll connector ● Airbag control module	W4A0 W5A0 W3A1—W3A2 W7A0 W6A0
03	● Front sensor (RH, LH) ● Airbag control module	W4A0 W6A0
04	● Airbag module (Passenger) ● Airbag main harness ● Airbag control module	W3A2 W5A0 W6A0
11	● Fuse No. 8 ● Airbag main harness ● Airbag control module ● Body harness	T5D3 W5A0 W6A0 —
12	● Roll connector ● Airbag module (Driver) ● Airbag main harness ● Airbag control module	W7A0 W3A1 W5A0 W6A0
13	● Airbag module (Driver) ● Roll connector ● Airbag main harness ● Airbag control module	W3A1 W7A0 W5A0 W6A0
21	● Airbag control module	W6A0
22	● Airbag module (Passenger) ● Airbag main harness ● Airbag control module	W3A2 W5A0 W6A0
23	● Airbag main harness ● Roll connector ● Airbag module (Driver/Passenger) ● Front sensor (RH, LH) ● Airbag control module	W5A0 W7A0 W3A1—W3A2 W4A0 W6A0
24	● Airbag module (Driver) ● Roll connector ● Airbag main harness ● Airbag control module	W3A1 W7A0 W5A0 W6A0
32	● Airbag module (Passenger) ● Roll connector ● Airbag main harness ● Airbag control module	W3A2 W7A0 W5A0 W6A0

2. AIRBAG COMPONENT PARTS APPEARANCE INSPECTION

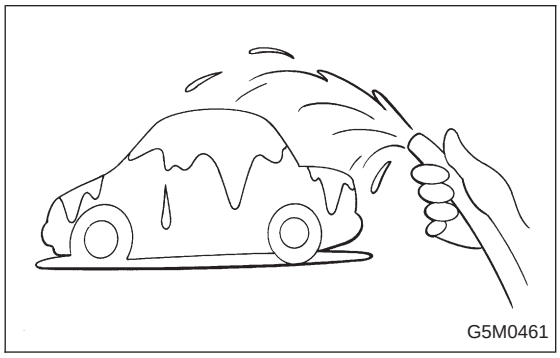
Conduct appearance inspection on parts selected.

NOTE:
Also check connector terminals, wiring harness, case, etc. for damage.

3. AIRBAG COMPONENT PARTS VIBRATION INSPECTION

1) Gently shake check parts (to determine faults.).
2) To check airbag module or roll connector, turn and tilt steering wheel.

CAUTION:
Do not shake or vibrate airbag control module and front sensor at the same time as erroneous operation may result.


G5M0461

4. SHOWERING INSPECTION TO BODY

1) Spray water on vehicle body.

CAUTION:
Do not directly spray water on airbag components.

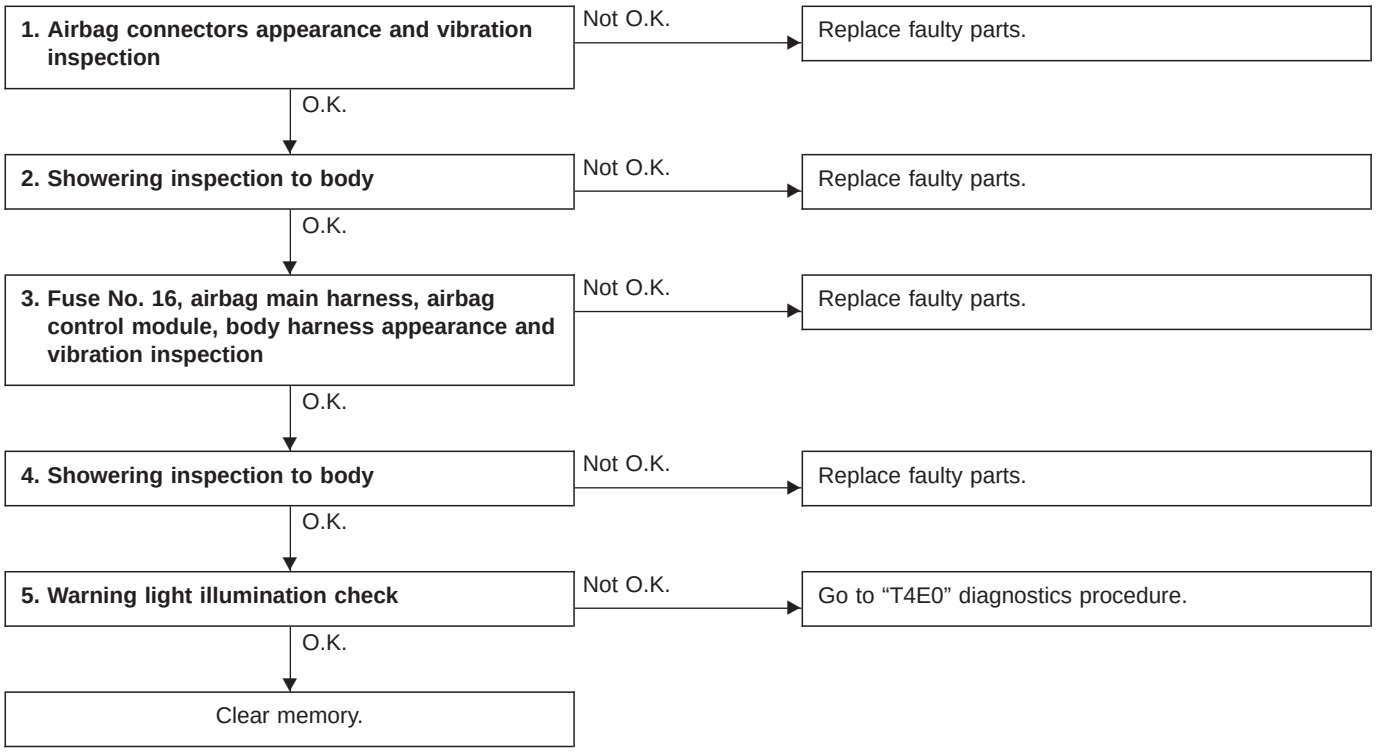
2) Check passenger compartment for traces of leaking.

NOTE:
Also check wiring harnesses as water may leak along them and get airbag component parts wet.

Q: WARNING LIGHT INDICATES TROUBLE CODE, THEN NORMAL CODE. — FLASHING NORMAL CODE. —

DIAGNOSIS:

- Airbag connector is faulty.
- Fuse No. 16 is blown.
- Airbag main harness is faulty.
- Airbag control module is faulty.
- Body harness is faulty.



CAUTION:
Before performing diagnostics on airbag system, turn ignition switch “OFF”, disconnect battery ground cable, and then wait at least 20 seconds.

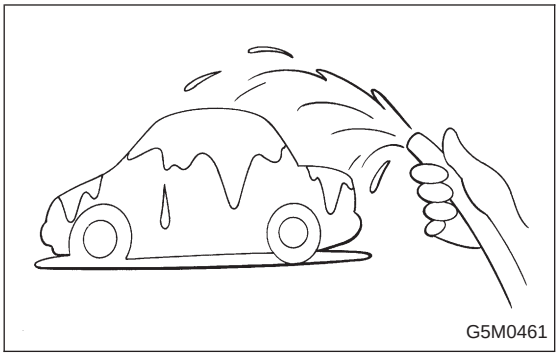
1. AIRBAG CONNECTORS APPEARANCE AND VIBRATION INSPECTION

1) Conduct appearance inspection on airbag connectors (AB2 through AB8). <Ref. to 5-5 [T100].>

NOTE:
Check terminals, case and wiring harnesses for damage.

2) Conduct vibration inspection on airbag connectors (AB2 through AB8). <Ref. to 5-5 [T100].>

NOTE:
Gently shake each airbag connector.



2. SHOWERING INSPECTION TO BODY

1) Spray water on vehicle body.

CAUTION:
Do not directly spray water on airbag components.

2) Check passenger compartment for traces of leaking.

NOTE:
If leaks are noted, also check wiring harnesses as water may leak along them and wet airbag connectors.

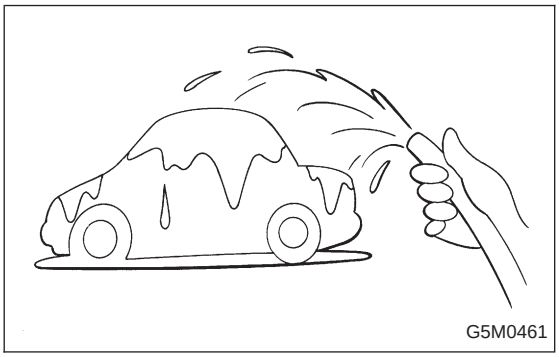
3. FUSE No. 16, AIRBAG MAIN HARNESS, AIRBAG CONTROL MODULE, BODY HARNESS APPEARANCE AND VIBRATION INSPECTION

1) Conduct appearance inspection on fuse No. 16 <Ref. to 5-5 [T5L3].>, airbag main harness <Ref. to 5-5 [W5A0].>, airbag control module <Ref. to 5-5 [W6A0].> and body harness.

NOTE:
Also check connectors, terminals, wiring harness and case for damage.

2) Conduct vibration inspection on fuse No. 16, airbag main harness, airbag control module and body harness.

NOTE:
Gently shake each part.



4. SHOWERING INSPECTION TO BODY

1) Spray water on vehicle body.

CAUTION:
Do not directly spray water on each part.

2) Check passenger compartment for traces of leaking.

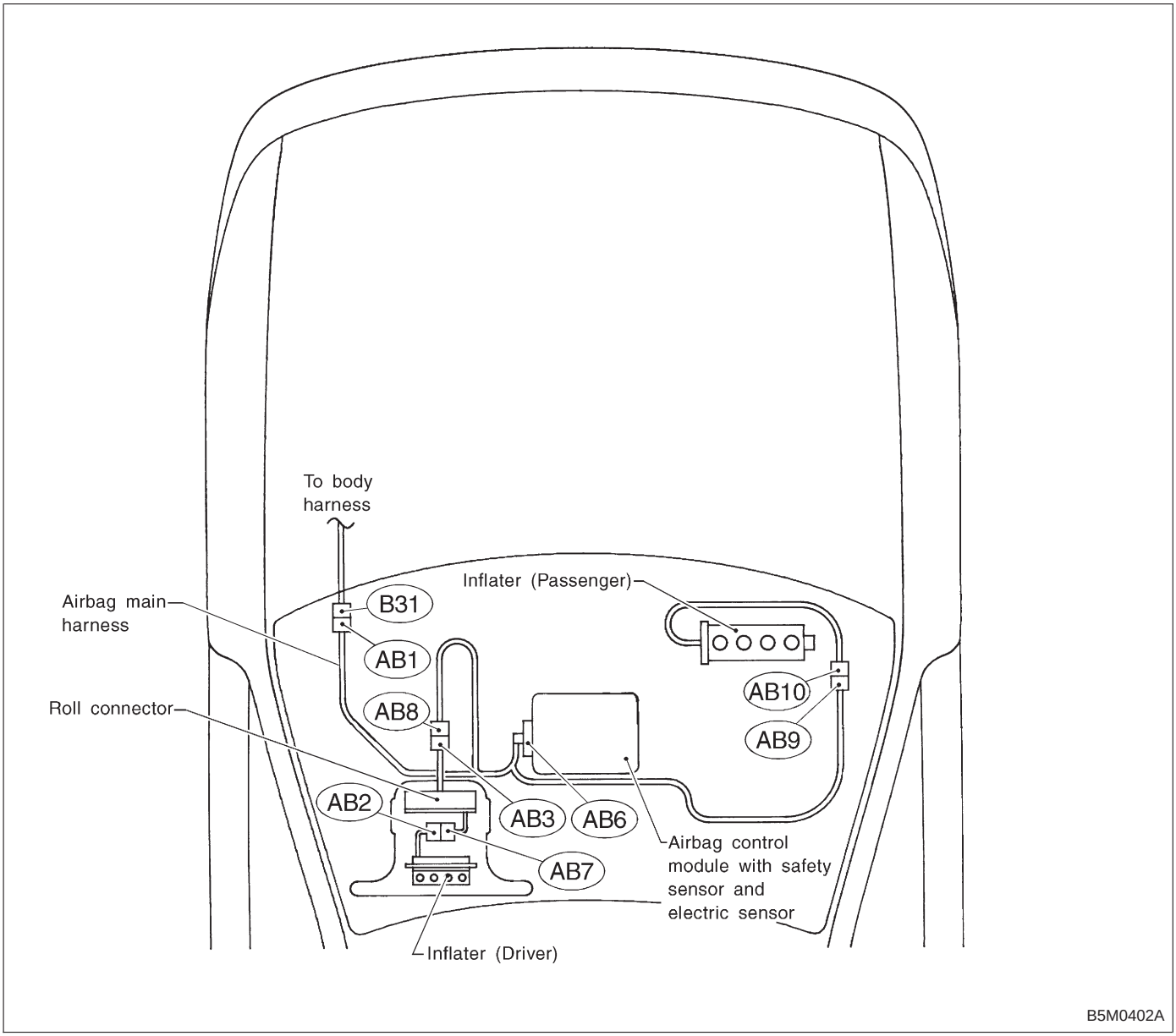
NOTE:
If leaks are noted, check wiring harnesses as water may leak along them and get parts wet.

5. WARNING LIGHT ILLUMINATION CHECK

Turn ignition switch “ON” (engine off) and observe airbag warning light.
Airbag warning light comes “ON” for 8 seconds then goes out and stays out.

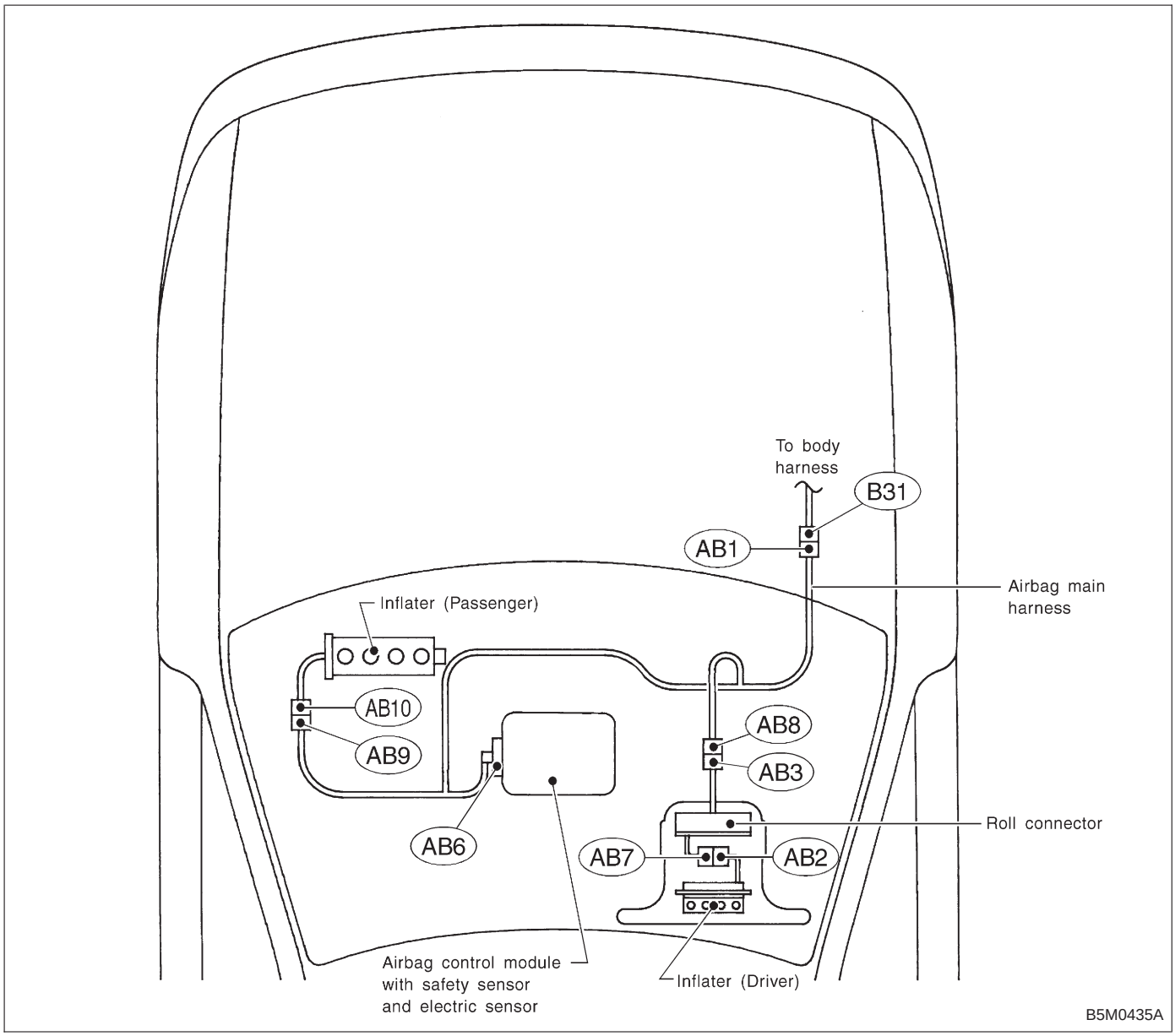
1. Electrical Components Location

1. LHD MODEL



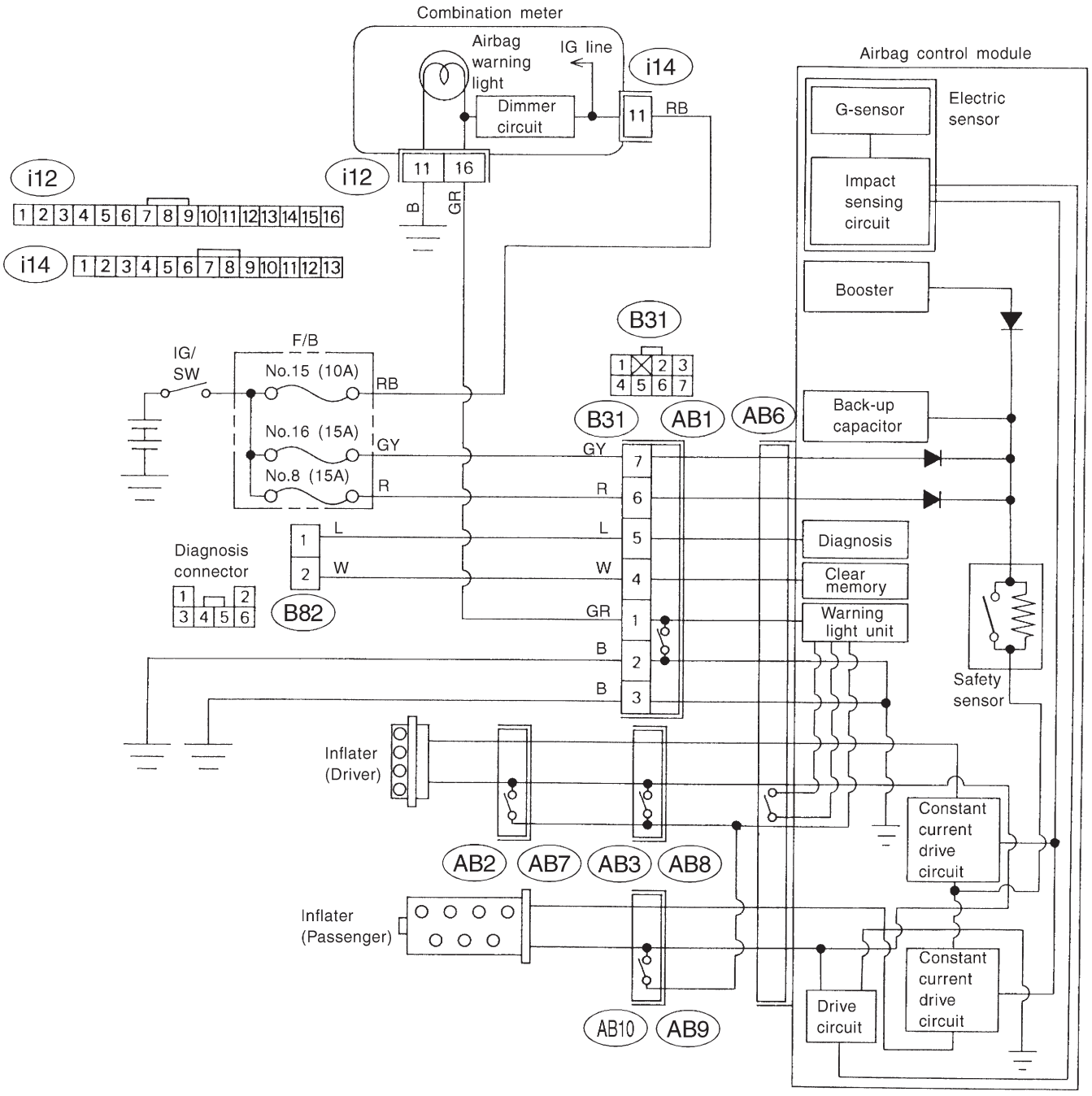
Connector No.	(AB1)	(AB2)	(AB3)	(AB6)	(AB7)	(AB8)	(AB9)	(AB10)
Pole	7	3	3	12	3	3	3	3
Color	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Male/Female	Male	Female	Female	Female	Male	Male	Male	Female

2. RHD MODEL



Connector No.	(AB1)	(AB2)	(AB3)	(AB6)	(AB7)	(AB8)	(AB9)	(AB10)
Pole	7	3	3	12	3	3	3	3
Color	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Male/Female	Male	Female	Female	Female	Male	Male	Male	Female

2. Schematic



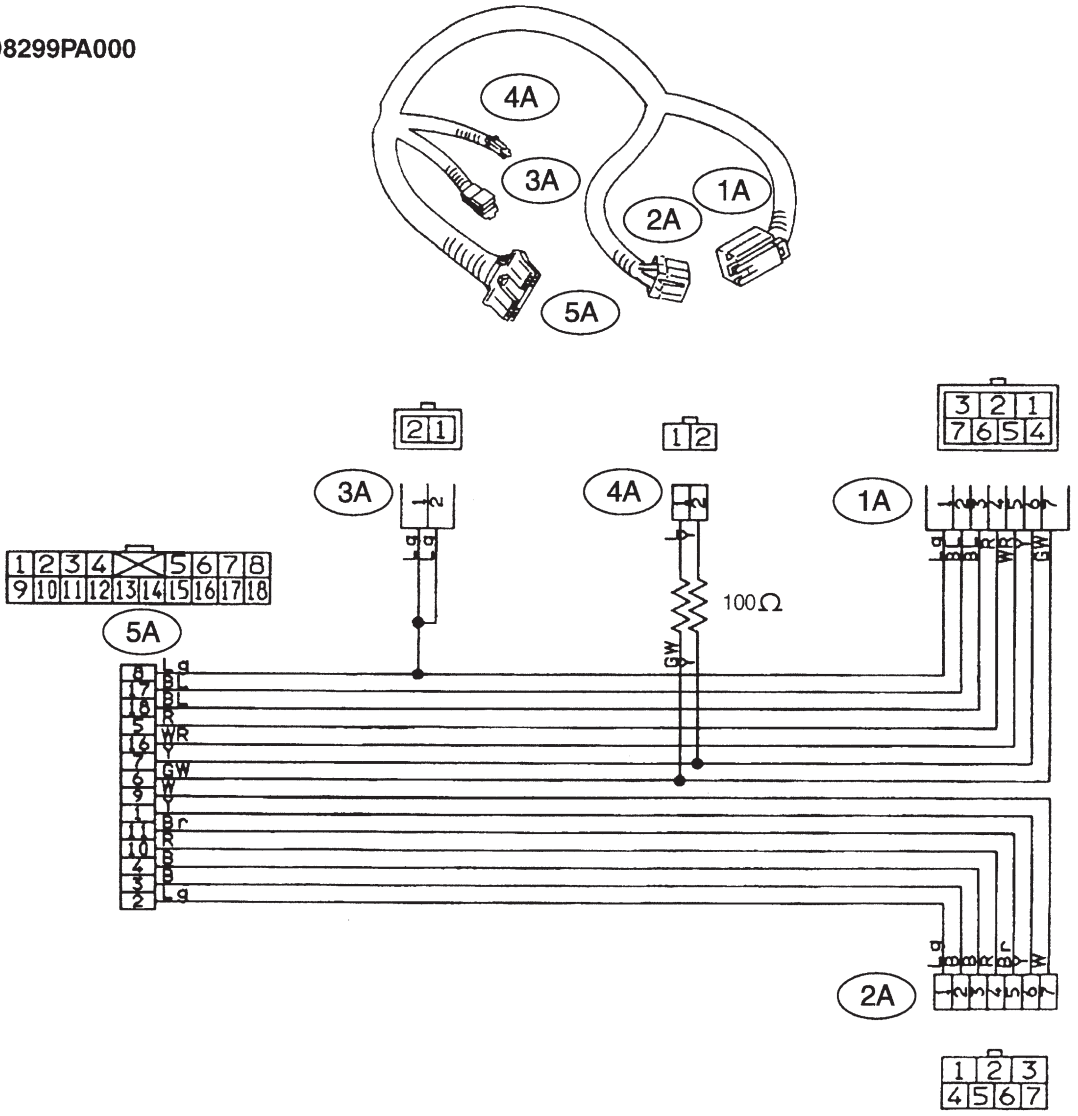
B5M0464A

3. Tools for Diagnostics

CAUTION:
Be sure to use specified test harness A, B or C when measuring voltage, resistance, etc. of AIRBAG system component parts.

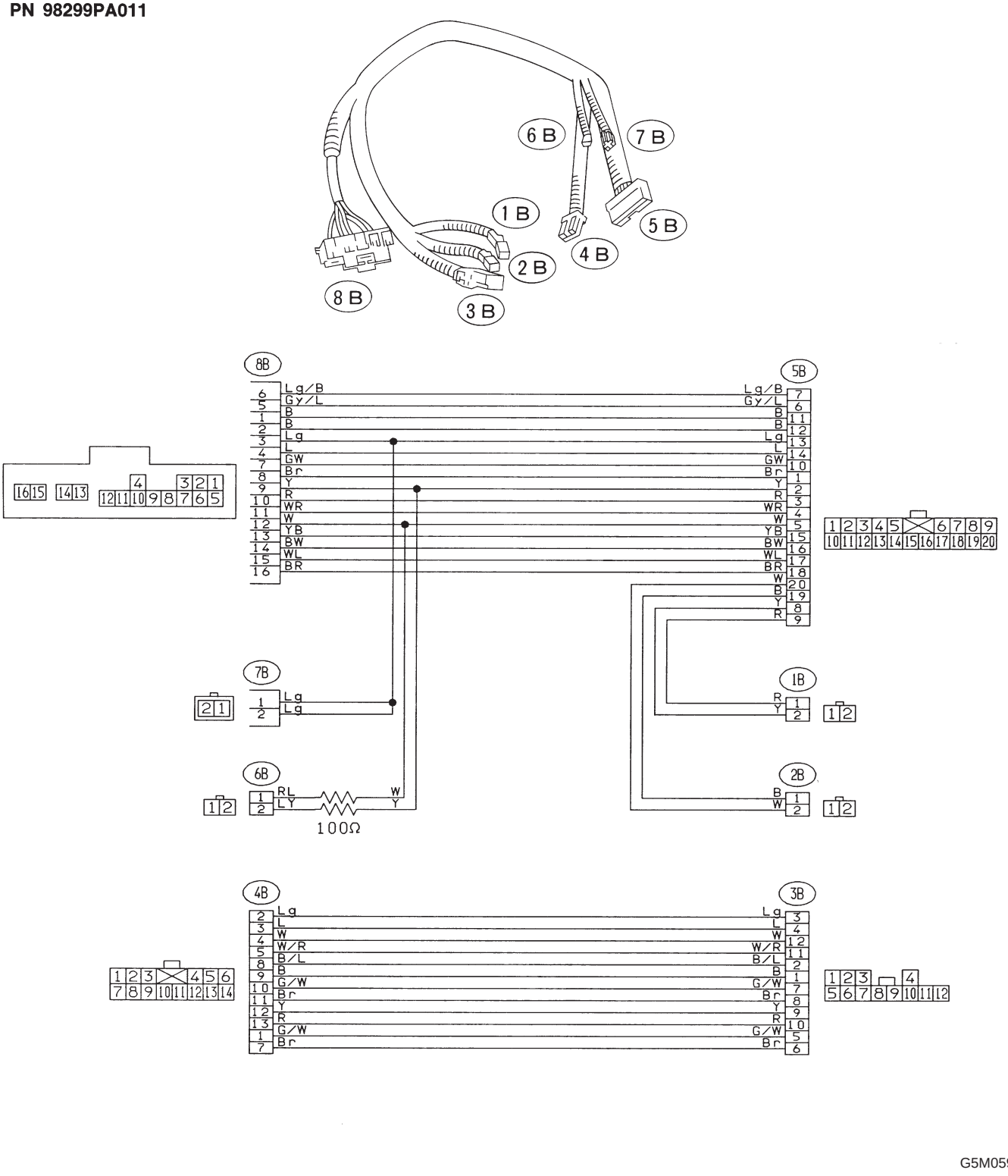
A: TEST HARNESS A

PN 98299PA000



B: TEST HARNESS B2

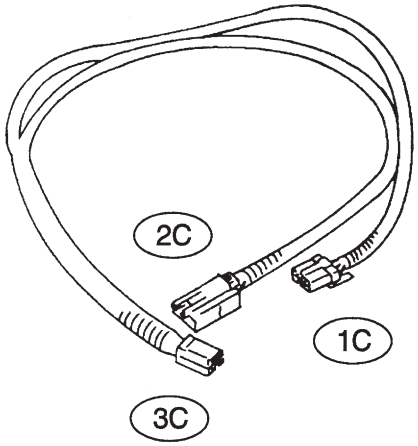
PN 98299PA011

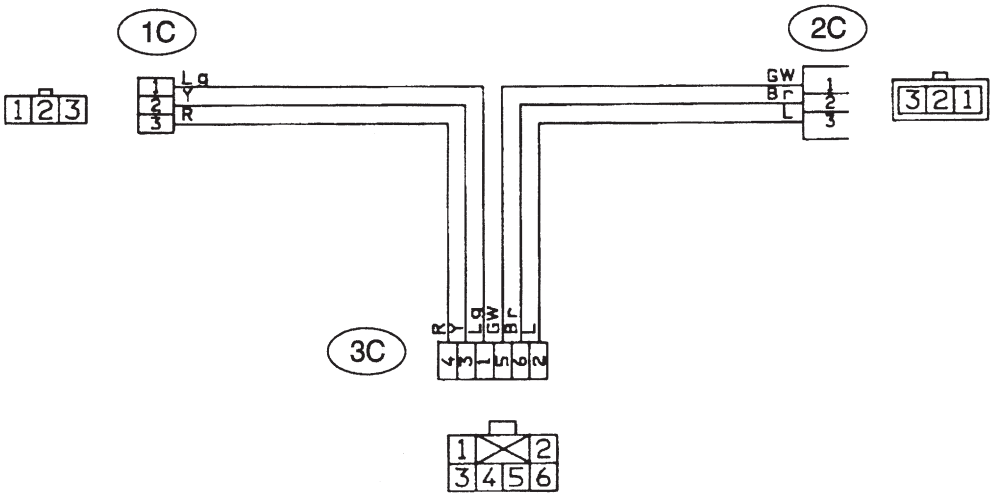


G5M0593

C: TEST HARNESS C

PN 98299PA020

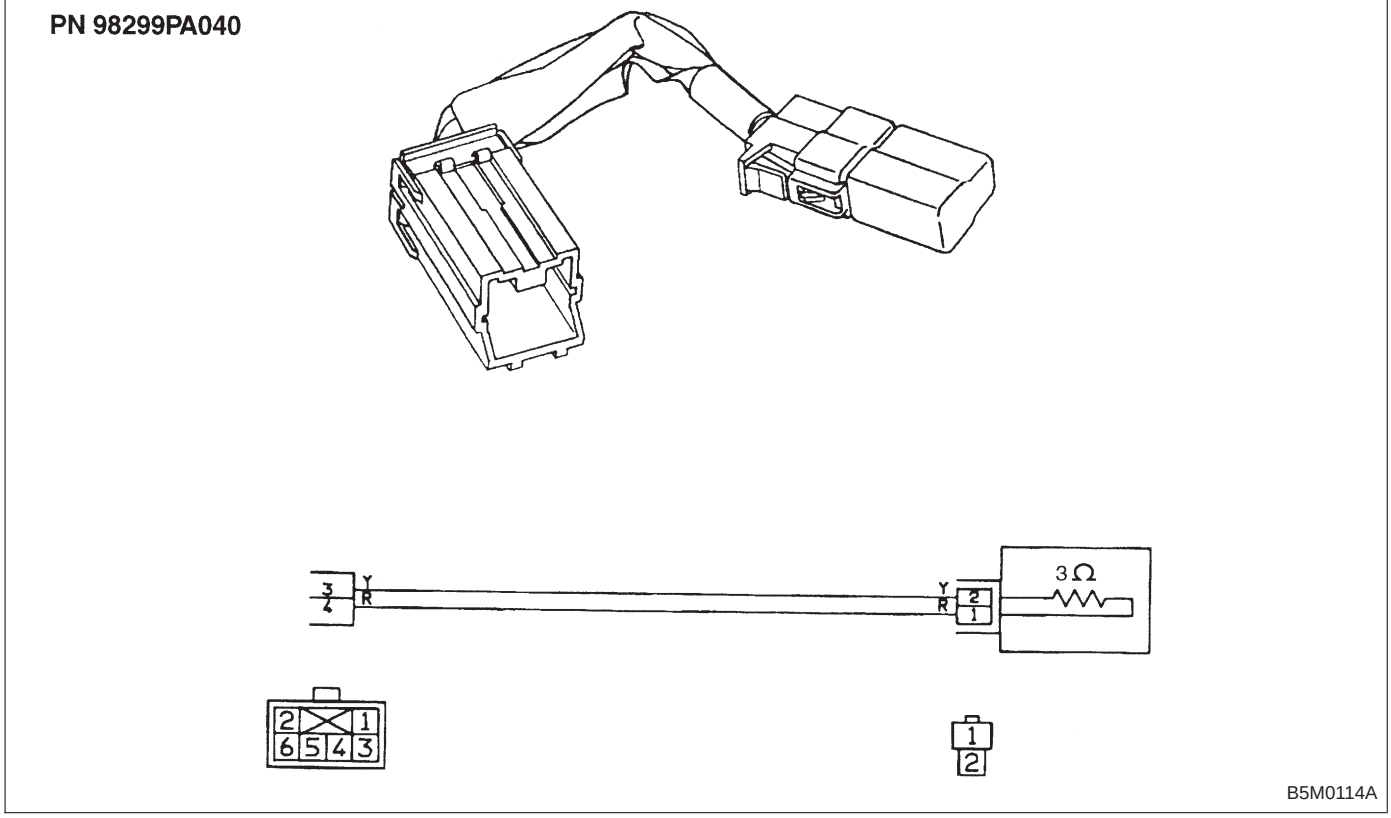




D: AIRBAG RESISTOR

The airbag resistor is used during diagnostics. The airbag resistor has the same resistance as the airbag module and thus provides safety when used instead of the airbag module. It also makes it possible to finish, diagnostics in less time.

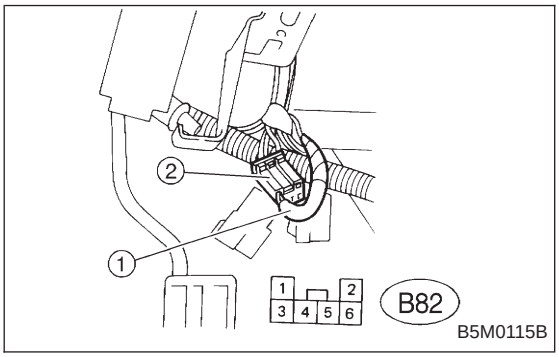
PN 98299PA040



4. Diagnostics Chart for On-board Diagnostic System

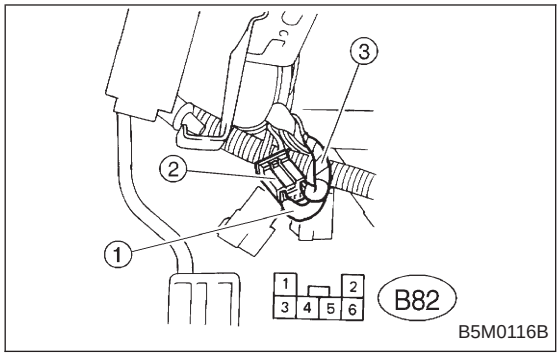
A: BASIC DIAGNOSTICS PROCEDURE

1) Airbag warning light comes “ON”.
2) Turn ignition switch to “ON”, (engine “OFF”) and observe airbag warning light.
3) If airbag warning light stays “ON” after about 7 seconds or remains “OFF”, or comes back “ON” after 30 seconds, this indicates a current problem. Proceed to step 8). If airbag warning light comes “ON” for about 7 seconds, then goes out and stays out, this indicates normal system operation at this time. Check the memory for intermittent problems by performing the procedure outlined in 5-5b [T4B0] “ON-BOARD DIAGNOSTICS”. Proceed to step 4).
4) If trouble code indicated, <Ref. to 5-5b [T4D1] — [T4D2].> proceed to step 5). If normal code indicated, <Ref. to 5-5b [T4D2].> proceed to step 6).
5) Repair and replacement, <Ref. to 5-5b [T5P1].> proceed to step 7).
6) Repair and replacement, <Ref. to 5-5b [T5Q1].> proceed to step 7).
7) Turn ignition switch “ON”, (engine “OFF”) and observe airbag warning light. If airbag warning light stays “ON” after about 7 seconds or comes back “ON” after 30 seconds, proceed to step 8). If airbag warning light comes “ON” for about 7 seconds, then goes out and stays out, proceed to step 9).
8) Repair and replacement. <Ref. to 5-5b [T4E0].> Proceed to step 10).
9) Clear memory. <Ref. to 5-5b [T4C0].> Proceed to step 10).
10) END



B: ON-BOARD DIAGNOSTIC

When the airbag system is in functioning condition, the airbag warning light will remain on for about 7 seconds and go out when the ignition switch is set to ON.
If there is any malfunction, the airbag warning light will either stay on or off continuously. In such cases, perform on-board diagnostic in accordance with the specified procedure to determine trouble codes.
1) Turn ignition switch ON (with engine OFF).
2) Connect DIAG. terminal ① to No. 1 terminal of diagnosis connector ② located below lower cover.
3) Check in accordance with the trouble code indicated by the AIRBAG warning light, and record the trouble codes.
4) Turn the ignition switch “OFF” and remove the DIAG. terminal from No.1 terminal of diagnosis connector.



C: CLEAR MEMORY

After eliminating problem as per trouble code, clear memory as follows:
Make sure ignition switch is ON (and engine off). Connect one DIAG. terminal ① on diagnosis connector ② terminal No. 1.
While warning light is flashing, connect the other DIAG. terminal ③ on terminal No. 2 for at least three seconds.
After memory is cleared, normal warning light flashing rate resumes. (Warning light flashes every 0.6 seconds ON-OFF operation.) Memory cannot be cleared if any problem exists.
After clear memory and then DIAG. terminals ① and ③, extract from diagnosis connector ②.

D: LIST OF TROUBLE CODES

1. TROUBLE CODES

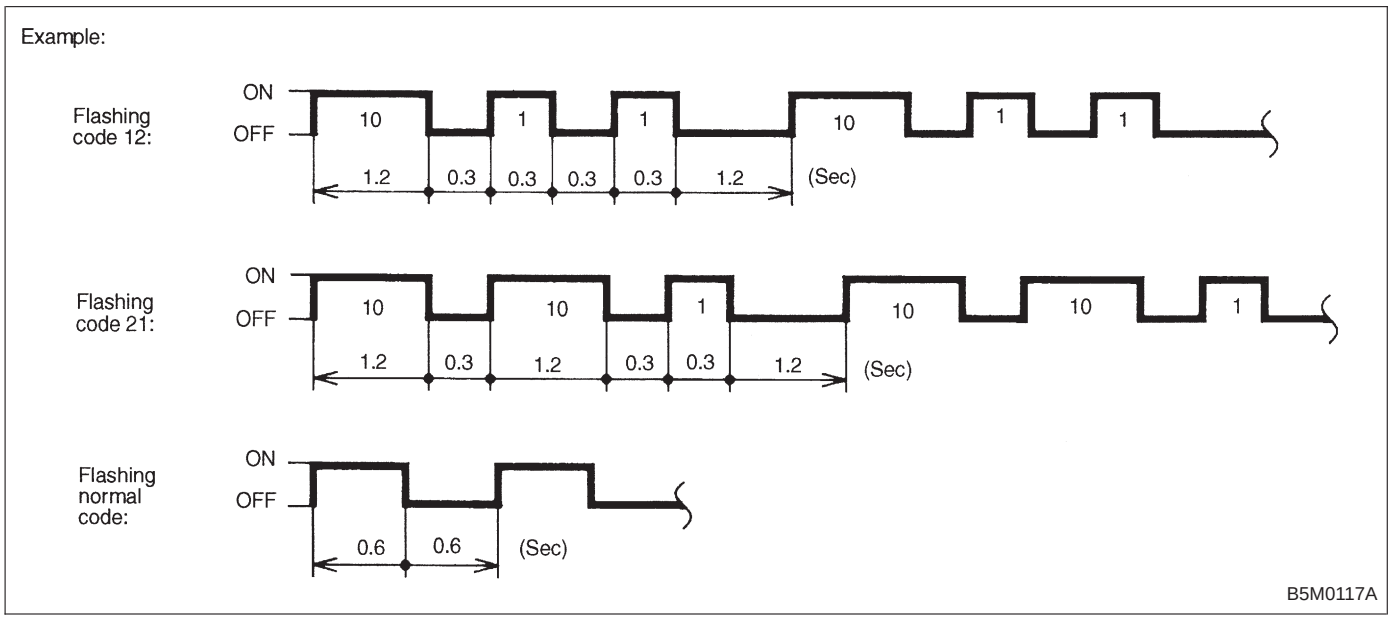
Trouble code/Contents of troubles	Memory function	Contents of diagnosis	Page
04	Provided.	1) Airbag main harness circuit is shorted. 2) Airbag module harness (Ps) circuit is shorted. 3) Airbag control module is faulty.	16
11	Provided.	1) Airbag control module is faulty. 2) Airbag main harness circuit is open. 3) Fuse No. 8 is blown. 4) Body harness circuit is open.	17
12	Provided.	1) Airbag main harness circuit is open. 2) Airbag module harness (Dr) circuit is open. 3) Roll connector circuit is open. 4) Airbag control module is faulty.	20
13	Provided.	1) Airbag main harness circuit is shorted. 2) Airbag module harness (Dr) is shorted. 3) Roll connector circuit is shorted. 4) Airbag control module is faulty.	21
14	Not provided.	1) (AB9) and (AB10) are not connected properly. 2) (AB2) and (AB7) are not connected properly. 3) (AB3) and (AB8) are not connected properly. 4) (AB6) is not connected properly to airbag control module.	22
21	Provided.	Airbag control module is faulty.	24
22	Provided.	1) Airbag main harness circuit is open. 2) Airbag module harness (Ps) circuit is open. 3) Airbag control module is faulty.	25
31	Not provided.	1) Airbag control module is faulty. 2) Airbag main harness circuit is open. 3) Fuse No. 16 is blown. 4) Body harness circuit is open.	26
33	Provided.	Airbag module is inflated.	28
34	Provided.	1) Airbag main harness circuit (Ps) is shorted to power supply. 2) Airbag module harness (Ps) is shorted to power supply. 3) Airbag control module is faulty.	29
41	Provided.	1) Airbag main harness circuit (Dr) is shorted to ground. 2) Airbag module harness circuit (Dr) is shorted to ground. 3) Roll connector circuit is shorted to ground. 4) Airbag control module is faulty.	30
42	Provided.	1) Airbag main harness circuit (Ps) is shorted to ground. 2) Airbag module harness circuit (Ps) is shorted to ground. 3) Airbag control module is faulty.	31
43	Provided.	1) Airbag main harness circuit (Dr) is shorted to power supply. 2) Airbag module harness (Dr) is shorted to power supply. 3) Roll connector is shorted to power supply. 4) Airbag control module is faulty.	32

Trouble code/Contents of troubles	Memory function	Contents of diagnosis	Page
Airbag warning light remains on.	Not provided.	1) Airbag warning light is faulty. 2) Airbag control module to airbag warning light harness circuit is shorted or open. 3) Grounding circuit is faulty. 4) Airbag control module is faulty. 5) (AB1) and (B39) are not connected properly.	33
Airbag warning light remains off.	Not provided.	1) Fuse No. 15 is blown. 2) Body harness circuit is open. 3) Airbag warning light is faulty. 4) Airbag main harness is faulty. 5) Airbag control module is faulty.	36
Warning light indicates trouble code, then normal code. (Flashing trouble code.)	Provided.	Airbag system component parts are faulty.	38
Warning light indicates trouble code, then normal code. (Flashing normal code.)	Not provided.	1) Airbag connector is faulty. 2) Fuse No. 16 is blown. 3) Airbag main harness is faulty. 4) Airbag control module is faulty. 5) Body harness is faulty.	41

[NOTE] Dr: Driver side Ps: Passenger side

2. HOW TO READ TROUBLE CODES

The AIRBAG warning light flashes a code corresponding to the faulty parts.
The long segment (1.2 sec on) indicates a “ten”, and the short segment (0.3 sec on) indicates a “one”.



E: DIAGNOSTICS PROCEDURE

1. AIRBAG WARNING LIGHT STAYS ON AFTER ABOUT 7 SECONDS.

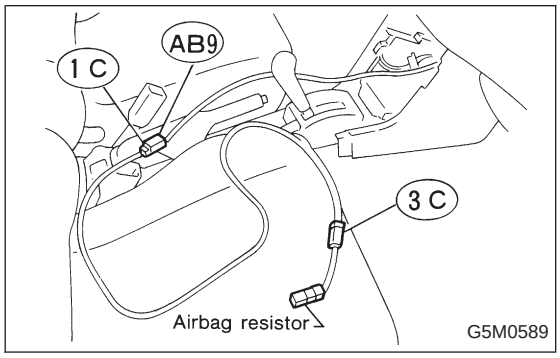
1) Perform on-board diagnostic. <Ref. to 5-5b [T4B0].>

2) Are trouble codes 4, 12, 13, 22, 34, 41, 42 or 43 indicated? <Ref. to 5-5b [T4D1]—[T4D2].>
Record trouble codes. If “YES” proceed to step 4). If “NO” proceed to step 3).

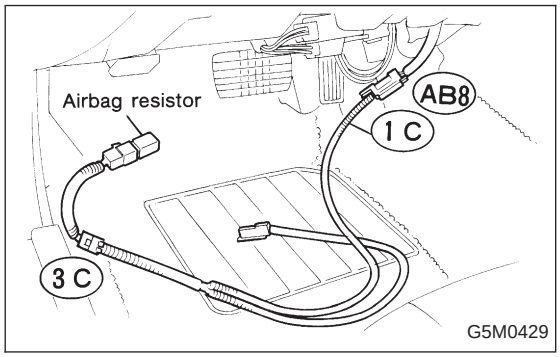
3) Proceed with diagnostics and repair according to trouble code indicated then perform step 15).

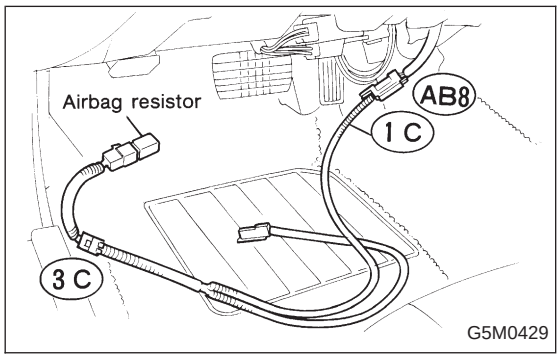
4) If codes 4, 22, 34, 42 are indicated, proceed to step 5). If codes 4, 22, 34, 42 are not indicated, proceed to step 10).

5) If codes 12, 13, 41, 43 are indicated, proceed to step 6). If codes 12, 13, 41, 43 are not indicated, proceed to step 11).

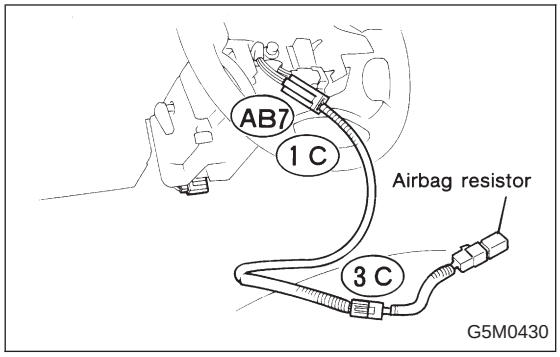


6) Turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Disconnect passenger side airbag module connector (AB9) to (AB10). <Ref. to 5-5b [W3A2].> Connect test harness C connector (1C) to (AB9). Connect airbag resistor to test harness C connector (3C). Remove lower cover panel and connect test harness C connector (1C) to (AB8) <Ref. to 5-4 [W1A0].> with airbag resistor attached to test harness C connector (3C).
Connect battery ground cable and turn ignition switch “ON”. Does airbag warning light go “OFF” after about 7 seconds and remain off for more than 30 seconds?
See “NOTE:”.
If “YES” proceed to step 7).
If “NO” proceed to step 3).



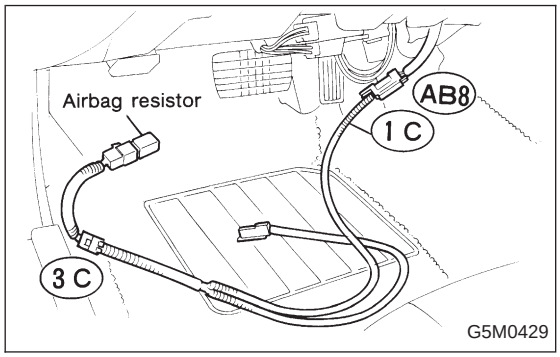


7) Turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Connect passenger side airbag module connector (AB9) to (AB10). Connect battery ground cable and turn ignition switch “ON”. Does airbag warning light go “OFF” after about 7 seconds and remain off for more than 30 seconds?
See “NOTE:”.
If “YES” proceed to step 8).
If “NO” proceed to step 13).

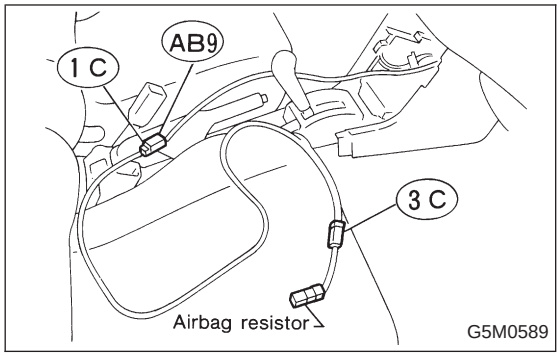


8) Turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Connect connector (AB8) to (AB3). Remove driver side airbag module and connect test harness C connector (1C) to (AB7). <Ref. to 5-5b [W3A1].> Connect airbag resistor to test harness C connector (3C). Connect battery ground cable and turn ignition switch “ON”. Does airbag warning light go “OFF” after about 7 seconds and remain off for more than 30 seconds?
See “NOTE:”.
If “YES” proceed to step 9).
If “NO” proceed to step 14).

9) Turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Replace with a new driver side airbag module. <Ref. to 5-5b [W3A1].> Proceed to step 15).



10) Turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Remove lower cover panel and connect test harness C connector (1C) to (AB8) <Ref. to 5-4 [W1A0].> with airbag resistor attached to test harness C connector (3C).
Connect battery ground cable and turn ignition switch “ON”. Does airbag warning light go “OFF” after about 7 seconds and remain off for more than 30 seconds?
See “NOTE:”.
If “YES” proceed to step 8).
If “NO” proceed to step 3).



11) Turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Disconnect passenger side airbag module connector (AB9) to (AB10). <Ref. to 5-5b [W3A2].>
Connect test harness C connector (1C) to (AB9). Connect airbag resistor to test harness C connector (3C).
Connect battery ground cable and turn ignition switch “ON”. Does airbag warning light go “OFF” after about 7 seconds and remain off for more than 30 seconds?
See “NOTE:”.
If “YES” proceed to step 12).
If “NO” proceed to step 3).

12) Turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Replace with a new passenger side airbag module <Ref. to 5-5b [W3A2].> then proceed to step 15).

13) Turn ignition switch “OFF”, disconnect battery ground cable and wait 20 seconds. Replace with a new passenger side airbag module <Ref. to 5-5b [W3A2].> then proceed to step 7).

14) Turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Replace with a new combination switch, <Ref. to 5-5b [W6A0].> and install driver side airbag module <Ref. to 5-5b [W3B0].>.
Connect battery ground cable and turn ignition switch “ON”. Does airbag warning light go “OFF” after about 7 seconds and remain off for more than 30 seconds?
See “NOTE:”.
If “YES” proceed to step 16).
If “NO” proceed to step 9).

15) Connect battery ground cable and turn ignition switch “ON”. Does airbag warning light go “OFF” after about 7 seconds and remain off for more than 30 seconds? See “NOTE:”.
If “YES” proceed to step 16).
If “NO” proceed to step 1).

16) Perform clear memory procedure. <Ref. to 5-5b [T4C0].>
If memory cannot be cleared, another trouble code exists. Return to step 1).
If memory can be cleared, proceed to step 17).

17) END

NOTE:
● Always remember to secure the green double locks before turning the ignition switch “ON”.
● In some cases the airbag warning light will go “OFF” after about 7 seconds but will turn “ON” again within 30 seconds. In this case continue diagnostics with the basic diagnostics procedures or trouble code procedures.

5. Diagnostics Chart with Trouble Code

<Ref. to 5-5b [T4D1].>

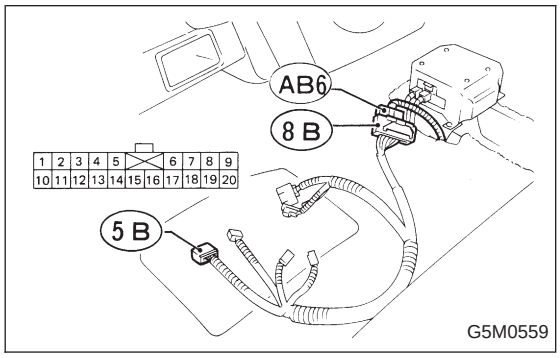
A: TROUBLE CODE 04

DIAGNOSIS:

- Airbag main harness circuit is shorted.
- Airbag module harness (Passenger) circuit is shorted.
- Airbag control module is faulty.

1. Airbag main harness inspection

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).



1. AIRBAG MAIN HARNESS INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [W5A0].>, and connect it to test harness B2 connector (8B).

2) Measure resistance between test harness B2 connector (5B) terminal.

CHECK ***: Connector & terminal (5B) No. 6 — (5B) No. 7: Is resistance more than 10 kΩ?***

YES : Replace airbag control module.

NO : Replace airbag main harness.

B: TROUBLE CODE 11

DIAGNOSIS:

- Airbag control module is faulty.
- Airbag main harness circuit is open.
- Fuse No. 8 is blown.
- Body harness circuit is open.

1. Airbag control module inspection

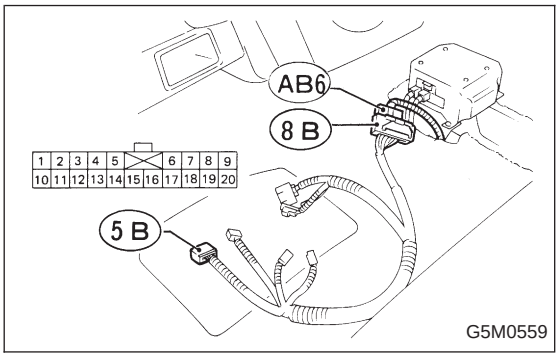
↓

2. Airbag main harness inspection

↓

3. Fuse No. 8 inspection

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).



1. AIRBAG CONTROL MODULE INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [W5A0].> and connect it to test harness B2 connector (8B).

2) Connect battery ground cable and turn ignition switch "ON". (engine off)

3) Measure voltage across connector (5B) terminal and chassis ground.

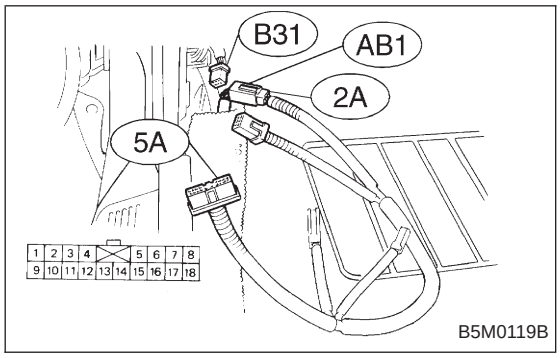
CHECK ***: Connector & terminal (5B) No. 2 (+) — Chassis ground (−): Is voltage more than 10 V?***

YES : Replace airbag control module.

NO : Go to step **2**.

2. AIRBAG MAIN HARNESS INSPECTION

1) Go to step 2) below after performing diagnostics on airbag system as per diagnosis procedure under “1. AIRBAG CONTROL MODULE INSPECTION” previously outlined.
2) Turn ignition switch “OFF”, disconnect battery ground terminal and then wait at least 20 seconds.



3) Disconnect body harness connector (B31) from connector (AB1) at front lower pillar, and connect connector (AB1) to test harness A connector (2A).

4) Measure resistance between test harness A connector (5A) terminal and test harness B2 connector (5B) terminal.

CHECK ***: Connector & terminal (5A) No. 1 — (5B) No. 2: Is resistance less than 10 Ω?***

YES : Go to step 5).

NO : Replace airbag main harness.

5) Measure resistance between (5A) and (5B) connector terminals and chassis ground.

CHECK ***: Connector & terminal (5A) No. 1 (+) — Chassis ground (−): Is resistance more than 10 kΩ?***

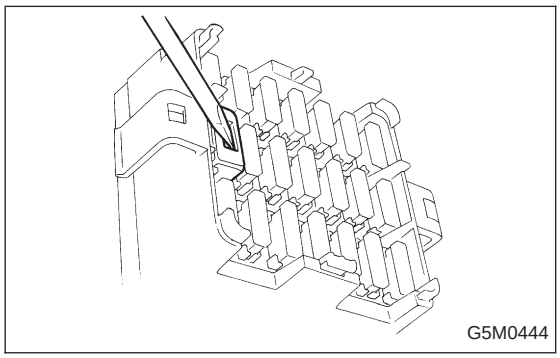
YES : Go to next CHECK .

NO : Replace airbag main harness.

CHECK ***: Connector & terminal (5B) No. 2 (+) — Chassis ground (−): Is resistance more than 10 kΩ?***

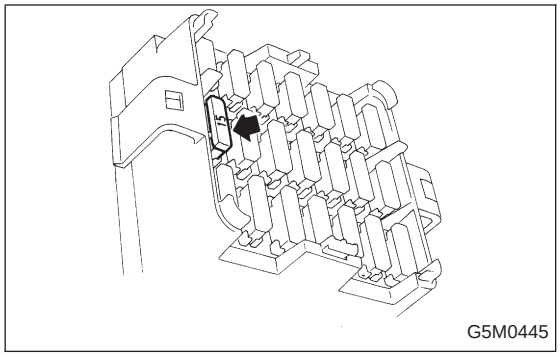
YES : Go to step **3**.

NO : Replace airbag main harness.



3. FUSE No. 8 INSPECTION

1) Turn ignition switch “OFF”, and remove airbag fuse protector.



2) Remove and visually check fuse No. 8.

CHECK ***: Is fuse No. 8 blown?***

YES : Replace fuse No. 8 if fuse No. 8 blows again, repair body harness.

NO : Repair body harness.

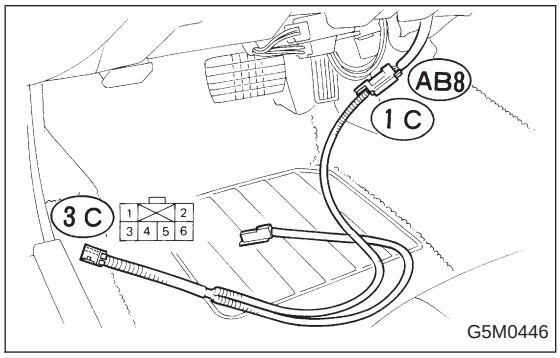
C: TROUBLE CODE 12

DIAGNOSIS:

- Airbag main harness circuit is open.
- Airbag module harness (Driver) circuit is open.
- Roll connector circuit is open.
- Airbag control module is faulty.

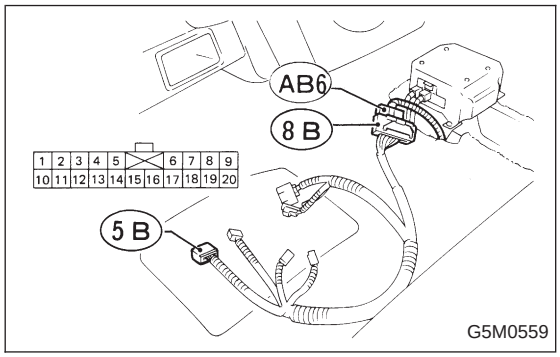
1. Airbag main harness inspection

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.



1. AIRBAG MAIN HARNESS INSPECTION

1) Remove lower cover panel <Ref. to 5-4 [W1A0].>, and connect connector (AB8) below steering column to test harness C connector (1C).



2) Disconnect connector (AB6) <Ref. to 5-5b [W5A0].> from airbag control module, and connect it to test harness B2 connector (8B) terminal.

3) Measure resistance between test harness B2 connector (5B) and test harness C connector (3C) terminals.

CHECK ***: Connector & terminal (5B) No. 14 — (3C) No. 4: Is resistance less than 10 Ω?***

YES : Go to next CHECK .

NO : Replace airbag main harness.

CHECK ***: Connector & terminal (5B) No. 1 — (3C) No. 3: Is resistance less than 10 Ω?***

YES : Replace airbag control module.

NO : Replace airbag main harness.

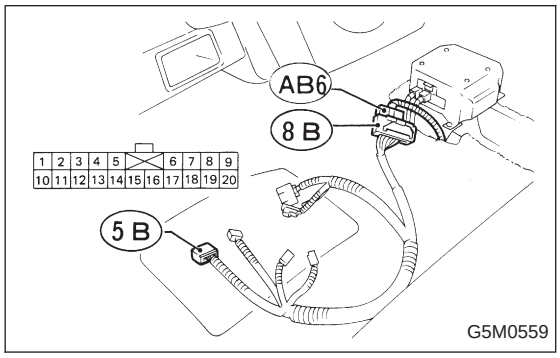
D: TROUBLE CODE 13

DIAGNOSIS:

- Airbag main harness circuit is shorted.
- Airbag module harness (Driver) is shorted.
- Roll connector circuit is shorted.
- Airbag control module is faulty.

1. Airbag main harness inspection

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).



1. AIRBAG MAIN HARNESS INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [W5A0].>, and connect it to test harness B2 connector (8B).

2) Measure resistance between test harness B2 connector (5B) terminal.

CHECK ***: Connector & terminal (5B) No. 1 — (5B) No. 14: Is resistance more than 10 kΩ?***

YES : Replace airbag control module.

NO : Replace airbag main harness.

E: TROUBLE CODE 14

DIAGNOSIS:

- (AB9) and (AB10) are not connected properly.
- (AB2) and (AB7) are not connected properly.
- (AB3) and (AB8) are not connected properly.
- (AB6) is not connected properly to airbag control module.

1. Double lock inspection for connectors (AB9) and (AB10)

↓

2. Airbag control module double lock inspection at connector (AB6)

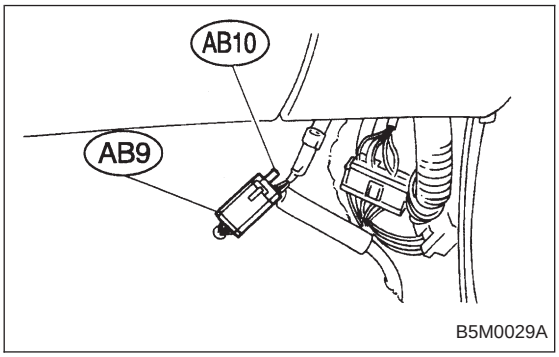
↓

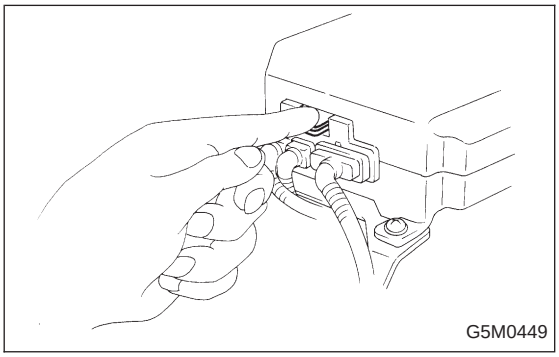
3. Double lock inspection for connectors (AB3) and (AB8)

↓

4. Roll connector double lock inspection at connectors (AB2) and (AB7)

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.





1. DOUBLE LOCK INSPECTION FOR CONNECTORS (AB9) AND (AB10)

1) Remove front pillar lower trim (Passenger side). <Ref. to 5-3 [W5A1].>
2) Check double lock of connectors (AB9) and (AB10).

CHECK ***: Is there poor contact in double lock of connectors (AB9) and (AB10)?***

YES : Repair poor contact in double lock of connectors (AB9) and (AB10).

NO : Go to step **2**.

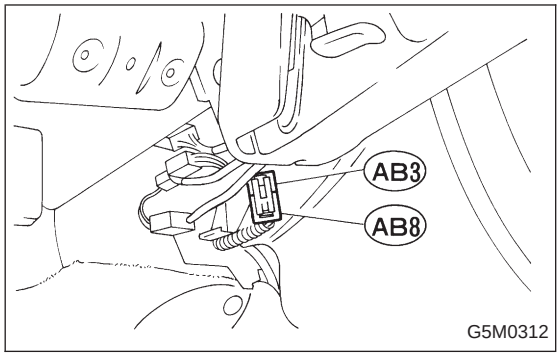
2. AIRBAG CONTROL MODULE DOUBLE LOCK INSPECTION AT CONNECTOR (AB6)

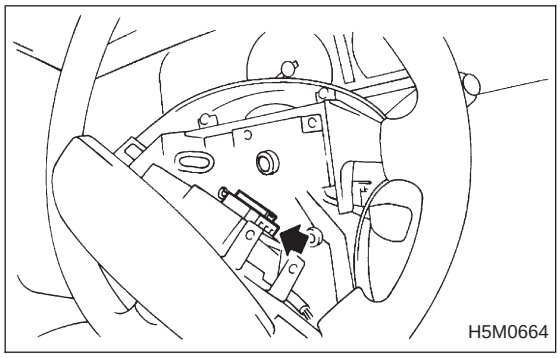
Check double lock of connector (AB6) connected to airbag control module. <Ref. to 5-5b [W5A0].>

CHECK ***: Is there poor contact in double lock of connector (AB6)?***

YES : Repair poor contact in double lock of connector (AB6).

NO : Go to step **3**.





3. DOUBLE LOCK INSPECTION FOR CONNECTORS (AB3) AND (AB8)

1) Remove lower cover panel. <Ref. to 5-4 [W1A0].>
2) Check double lock of connectors (AB3) and (AB8) below steering column.

CHECK ***: Is there poor contact in double lock of connectors (AB3) and (AB8)?***

YES : Repair poor contact in double lock of connectors (AB3) and (AB8).

NO : Go to step **4**.

4. ROLL CONNECTOR DOUBLE LOCK INSPECTION AT CONNECTORS (AB2) AND (AB7)

Remove driver side airbag module <Ref. to 5-5b [W3A1].>, and check double lock of connectors (AB2) and (AB7) at roll connector.

CHECK ***: Is there poor contact in double lock of connectors (AB2) and (AB7)?***

YES : Repair poor contact in double lock of connectors (AB2) and (AB7).

NO : Replace airbag control module.

F: TROUBLE CODE 21

DIAGNOSIS:

- Airbag control module is faulty.

1. Check if trouble code 21 is indicated.

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal, and then wait at least 20 seconds. <Ref. to 5-5b [W5A0].>

1. CHECK IF TROUBLE CODE 21 IS INDICATED.

Confirm flashing trouble code according to 5-5b [T4A0] "BASIC DIAGNOSTICS PROCEDURE".

CHECK ***: Is airbag warning light trouble code 21 indicated?***

YES : Replace airbag control module.

NO : Clear memory.

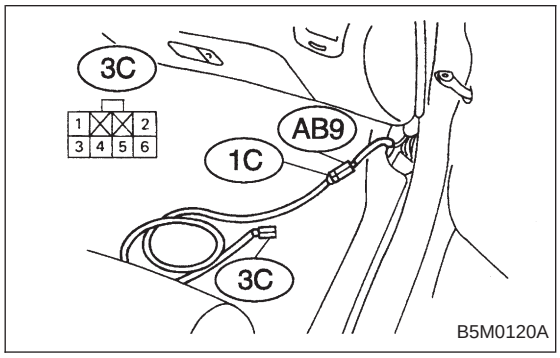
G: TROUBLE CODE 22

DIAGNOSIS:

- Airbag main harness circuit is open.
- Airbag module harness (Passenger) circuit is open.
- Airbag control module is faulty.

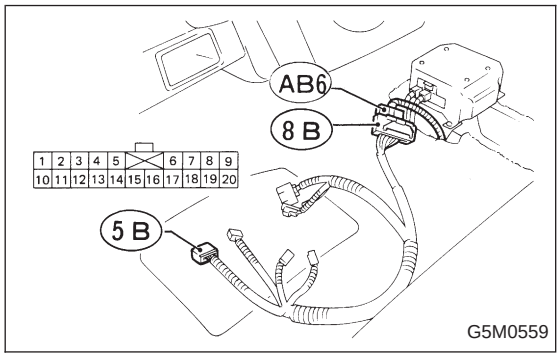
1. Airbag main harness inspection

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.



1. AIRBAG MAIN HARNESS INSPECTION

1) Remove front pillar lower trim (Passenger side). <Ref. to 5-3 [W5A1].>, disconnect connector (AB9) and (AB10) and connect connector (AB9) to test harness C connector (1C).



2) Disconnect connector (AB6) <Ref. to 5-5b [W5A0].> from airbag control module, and connect it to test harness B2 connector (8B) terminal.

3) Measure resistance between test harness B2 connector (5B) and test harness C connector (3C) terminals.

CHECK ***: Connector & terminal (5B) No. 6 — (3C) No. 4: Is resistance less than 10 Ω?***

YES : Go to next CHECK .

NO : Replace airbag main harness.

CHECK ***: Connector & terminal (5B) No. 7 — (3C) No. 3: Is resistance less than 10 Ω?***

YES : Replace airbag control module.

NO : Replace airbag main harness.

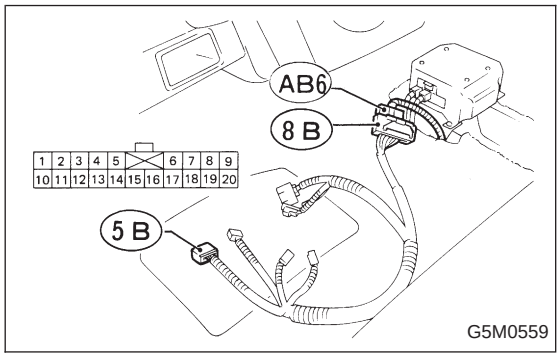
H: TROUBLE CODE 31

DIAGNOSIS:

- Airbag control module is faulty.
- Airbag main harness circuit is open.
- Fuse No. 16 is blown.
- Body harness circuit is open.

1. Airbag control module inspection
↓
2. Airbag main harness inspection
↓
3. Fuse No. 16 inspection

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).



1. AIRBAG CONTROL MODULE INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [W5A0].>, and connect it to test harness B2 connector (8B).

2) Connect battery ground cable and turn ignition switch "ON" (engine off).

3) Measure voltage across connector (5B) terminal and chassis ground.

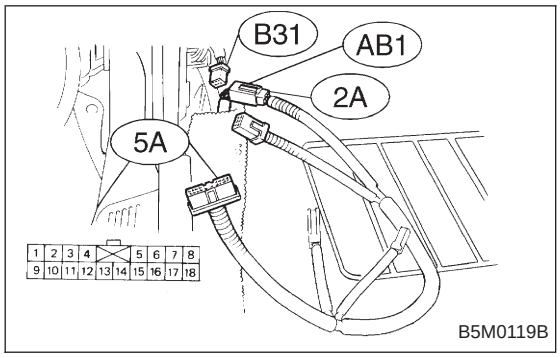
CHECK ***: Connector & terminal (5B) No. 5 (+) — Chassis ground (−): Is voltage more than 10 V?***

YES : Replace airbag control module.

NO : Go to step **2**.

2. AIRBAG MAIN HARNESS INSPECTION

1) Go to step 2) below after performing diagnostics on airbag system as per diagnosis procedure under “1. AIRBAG CONTROL MODULE INSPECTION” previously outlined.
2) Turn ignition switch “OFF”, disconnect battery ground cable and then wait at least 20 seconds.



3) Disconnect connector (AB1) from body harness connector (B31) at front lower pillar (driver side), and connect connector (AB1) to test harness A connector (2A).

4) Measure resistance between test harness A connector (5A) and test harness B2 connector (5B) terminals.

CHECK ***: Connector & terminal (5A) No. 9 — (5B) No. 5: Is resistance less than 10 Ω?***

YES : Go to step 5).

NO : Replace airbag main harness.

5) Measure resistance between each terminal of connectors (5A) and (5B) and chassis ground.

CHECK ***: Connector & terminal (5A) No. 9 (+) — Chassis ground (−):***

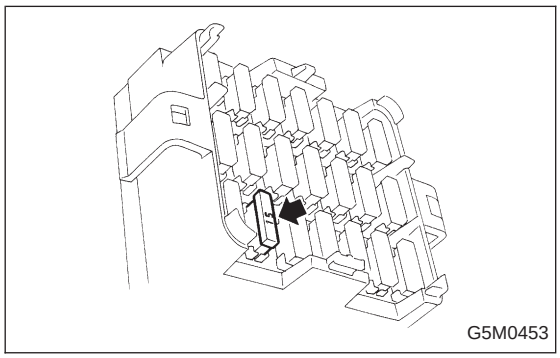
YES : Go to next CHECK .

NO : Replace airbag main harness.

CHECK ***: Connector & terminal (5B) No. 5 (+) — Chassis ground (−): Is resistance more than 10 kΩ?***

YES : Go to step **3**.

NO : Replace airbag main harness.



3. FUSE No. 16 INSPECTION

Make sure ignition switch is turned “OFF”, then remove and visually check fuse No. 16.

CHECK ***: Is fuse No. 16 blown?***

YES : Replace fuse No. 16. If fuse No. 16 blows again, repair body harness.

NO : Repair body harness.

I: TROUBLE CODE 33

DIAGNOSIS:

- Airbag module is inflated.

1. Check if trouble code 33 is indicated.

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal, and then wait at least 20 seconds. <Ref. to 5-5 [W6A0].>

1. CHECK IF TROUBLE CODE 33 IS INDICATED.

Confirm flashing trouble code according to 5-5b [T4A0] "BASIC DIAGNOSTICS PROCEDURE".

CHECK ***: Is airbag warning light trouble code 33 indicated?***

YES : Replace airbag control module.

NO : Clear memory.

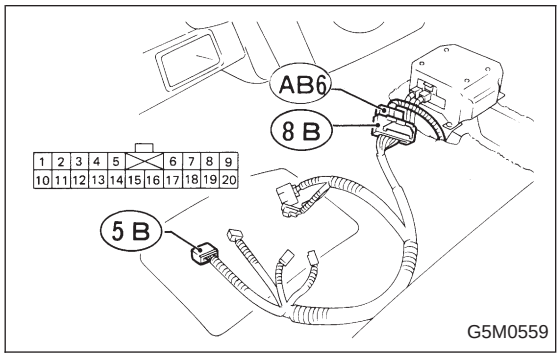
J: TROUBLE CODE 34

DIAGNOSIS:

- Airbag main harness circuit (Passenger) is shorted to power supply.
- Airbag module harness (Passenger) is shorted to power supply.
- Airbag control module is faulty.

1. Airbag main harness inspection

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal and then wait at least 20 seconds.
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).



1. AIRBAG MAIN HARNESS INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [W5A0].>, and connect it to test harness B2 connector (8B).

2) Connect battery ground cable and turn ignition switch "ON" (engine off).

3) Measure voltage across each test harness B2 connector (5B) terminal and chassis ground.

CHECK ***: Connector & terminal (5B) No. 6 (+) — Chassis ground (−): Is voltage less than 1 V?***

YES : Go to next CHECK .

NO : Replace airbag main harness.

CHECK ***: Connector & terminal (5B) No. 7 (+) — Chassis ground (−): Is voltage less than 1 V?***

YES : Replace airbag control module.

NO : Replace airbag main harness.

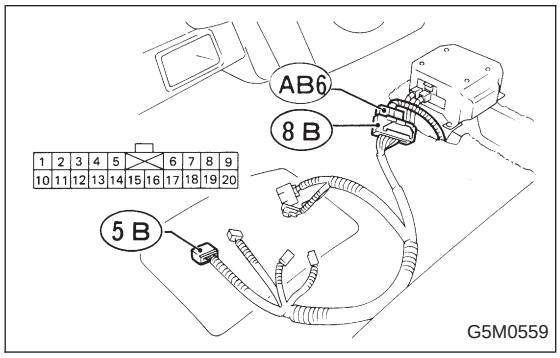
K: TROUBLE CODE 41

DIAGNOSIS:

- Airbag main harness circuit (Driver) is shorted to ground.
- Airbag module harness (Driver) is shorted to ground.
- Roll connector circuit is shorted to ground.
- Airbag control module is faulty.

1. Airbag main harness inspection

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).



1. AIRBAG MAIN HARNESS INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [W5A0].>, and connect it to test harness B2 connector (8B).

2) Measure resistance between test harness B2 connector (5B) terminals and chassis ground.

CHECK ***: Connector & terminal (5B) No. 1 (+) — Chassis ground (−): Is resistance more than 200 Ω?***

YES : Go to next CHECK .

NO : Replace airbag main harness.

CHECK ***: Connector & terminal (5B) No. 14 (+) — Chassis ground (−): Is resistance more than 200 Ω?***

YES : Replace airbag control module.

NO : Replace airbag main harness.

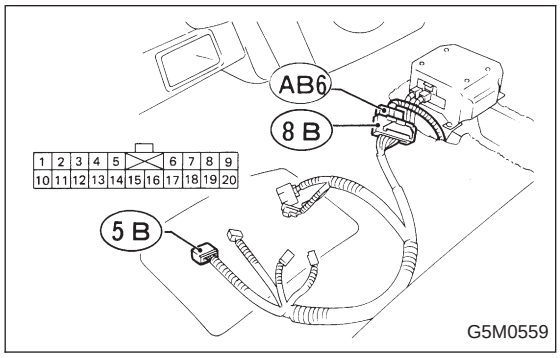
L: TROUBLE CODE 42

DIAGNOSIS:

- Airbag main harness circuit (Passenger) is shorted to ground.
- Airbag module harness circuit (Passenger) is shorted to ground.
- Airbag control module is faulty.

1. Airbag main harness inspection

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).



1. AIRBAG MAIN HARNESS INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [W5A0].>, and connect it to test harness B2 connector (8B).

2) Measure resistance between test harness B2 connector (5B) terminals and chassis ground.

CHECK ***: Connector & terminal (5B) No. 6 (+) — Chassis ground (−): Is resistance more than 200 Ω?***

YES : Go to next CHECK .

NO : Replace airbag main harness.

CHECK ***: Connector & terminal (5B) No. 7 (+) — Chassis ground (−): Is resistance more than 200 Ω?***

YES : Replace airbag control module.

NO : Replace airbag main harness.

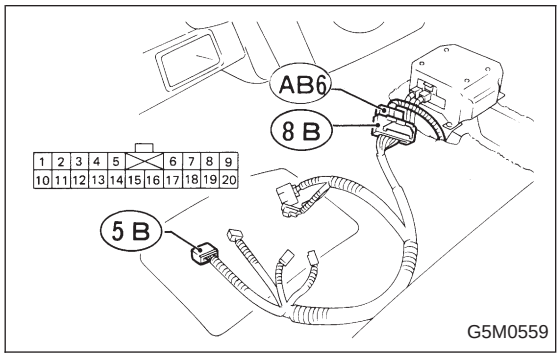
M: TROUBLE CODE 43

DIAGNOSIS:

- Airbag main harness circuit (Driver) is shorted to power supply.
- Airbag module harness (Driver) is shorted to power supply.
- Roll connector is shorted to power supply.
- Airbag control module is faulty.

1. Airbag main harness inspection

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch “OFF”, disconnect battery ground terminal and then wait at least 20 seconds.
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).



1. AIRBAG MAIN HARNESS INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [W5A0].>, and connect it to test harness B2 connector (8B).

2) Connect battery ground cable and turn ignition switch “ON” (engine off).

3) Measure voltage across each test harness B2 connector (5B) terminal and chassis ground.

CHECK ***: Connector & terminal (5B) No. 1 (+) — Chassis ground (−): Is voltage less than 1 V?***

YES : Go to next CHECK .

NO : Replace airbag main harness.

CHECK ***: Connector & terminal (5B) No. 14 (+) — Chassis ground (−): Is voltage less than 1 V?***

YES : Replace airbag control module.

NO : Replace airbag main harness.

N: AIRBAG WARNING LIGHT REMAINS ON.

DIAGNOSIS:

- Airbag warning light is faulty.
- Airbag control module to airbag warning light harness circuit is shorted or open.
- Grounding circuit is faulty.
- Airbag control module is faulty.
- (AB1) and (B31) are not connected properly.

1. Double lock inspection for connectors (AB1) and (B31)

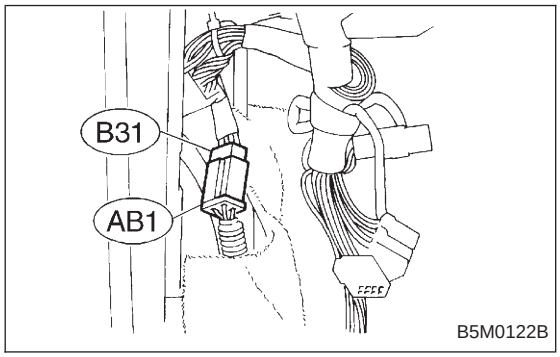
↓

2. Inspection of body harness, connector and airbag warning light

↓

3. Grounding circuit inspection

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.



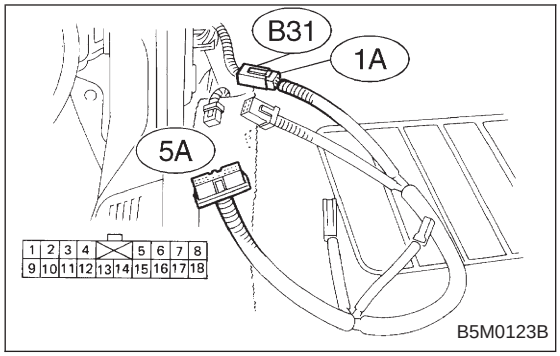
1. DOUBLE LOCK INSPECTION FOR CONNECTORS (AB1) AND (B31)

1) Remove front pillar lower trim (Driver side).
2) Check double lock of connectors (AB1) and (B31).

CHECK ***: Is there poor contact in double lock of connectors (AB1) and (B31)?***

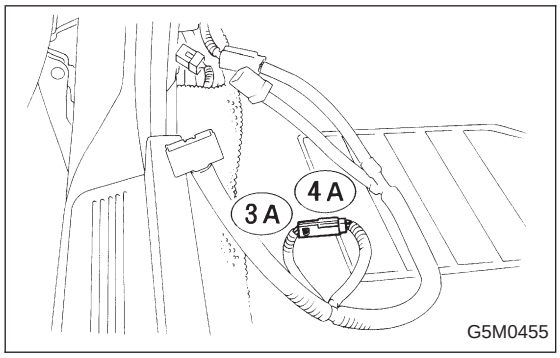
YES : Repair poor contact in double lock of connectors (AB1) and (B31).

NO : Go to step **2**.



2. INSPECTION OF BODY HARNESS, CONNECTOR AND AIRBAG WARNING LIGHT

1) Turn ignition switch “OFF” and connect body harness connector (B31) to test connector A connector (1A).

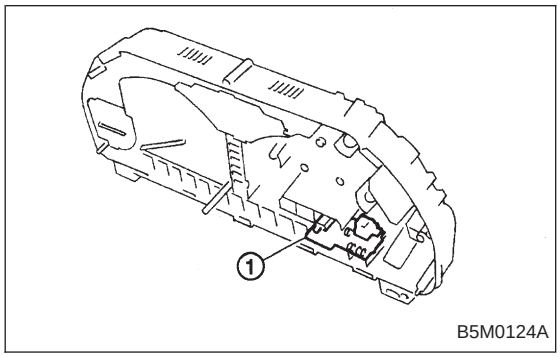


2) Connect battery ground cable and turn ignition switch “ON”, (engine off) and connect connectors (3A) and (4A).

CHECK ***: Does the airbag warning light come off?***

YES : Go to step 3).

NO : Go to next CHECK.

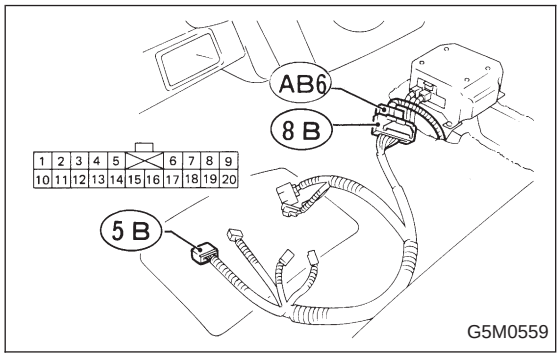


CHECK ***: Is there anything unusual to body harness?***

YES : Repair body harness.

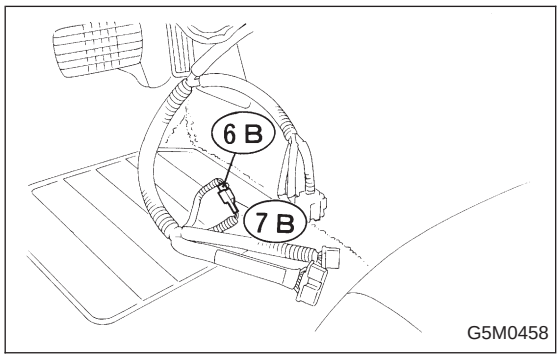
NO : Replace airbag warning light module ①.

NOTE:
After problem has been eliminated, disconnect connectors (3A) and (4A).



3) Turn ignition switch “OFF”, disconnect battery ground cable and then wait at least 20 seconds, and re-connect connectors (AB1) and (B31).

4) Remove instrument panel lower cover and disconnect (AB3) with (AB8), then disconnect connector (AB6) from airbag control module, <Ref. to 5-5b [W5A0].> and connect it to test harness B2 connector (8B).



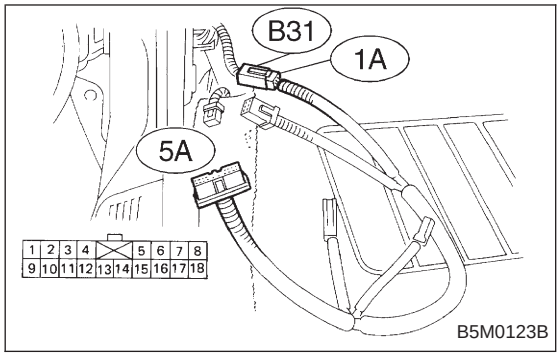
5) Connect battery ground cable and turn ignition switch “ON,” (engine off) and connect connectors (6B) and (7B).

CHECK ***: Does the airbag warning light come on?***

YES : Go to step **3**.

NO : Replace airbag main harness.

NOTE:
After problem has been eliminated, disconnect connectors (6B) and (7B).



3. GROUNDING CIRCUIT INSPECTION

1) Turn ignition switch “OFF”, disconnect battery ground cable and then wait at least 20 seconds. Disconnect connector (AB1) from body harness connector (B31), and connect connector (B31) to test harness A connector (1A). Measure resistance between connector (5A) terminal and chassis ground.

CHECK ***: Connector & terminal (5A) No. 17 (+) — Chassis ground (−): Is resistance less than 10 Ω?***

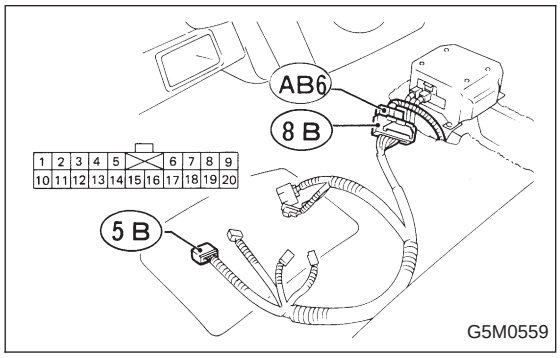
YES : Go to next CHECK .

NO : Repair body grounding circuit.

CHECK ***: Connector & terminal (5A) No. 18 (+) — Chassis ground (−): Is resistance less than 10 Ω?***

YES : Go to step 2).

NO : Repair body grounding circuit.



2) Connect connectors (AB1) and (B31). Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [W5A0].>, and connect it to test harness B2 connector (8B).

3) Measure resistance between each test harness B2 connector (5B) terminal and chassis ground.

CHECK ***: Connector & terminal (5B) No. 11 (+) — Chassis ground (−): Is resistance less than 10 Ω?***

YES : Go to next CHECK .

NO : Replace airbag main harness.

CHECK ***: Connector & terminal (5B) No. 12 (+) — Chassis ground (−): Is resistance less than 10 Ω?***

YES : Replace airbag control module.

NO : Replace airbag main harness.

O: AIRBAG WARNING LIGHT REMAINS OFF.

DIAGNOSIS:

- Fuse No. 15 is blown.
- Body harness circuit is open.
- Airbag warning light is faulty.
- Airbag main harness is faulty.
- Airbag control module is faulty.

1. Fuse No. 15 inspection

↓

2. Body harness inspection

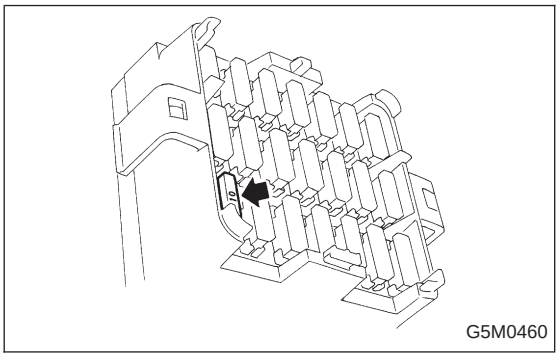
↓

3. Airbag warning light module (in combination meter) inspection

↓

4. Airbag main harness inspection

CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal, and then wait at least 20 seconds.



1. FUSE No. 15 INSPECTION

Remove and visually check fuse No. 15.

CHECK ***: Is fuse No. 15 blown?***

YES : Replace fuse No. 15.
If fuse No. 15 blows again, go to step **2**.

NO : Go to step **2**.

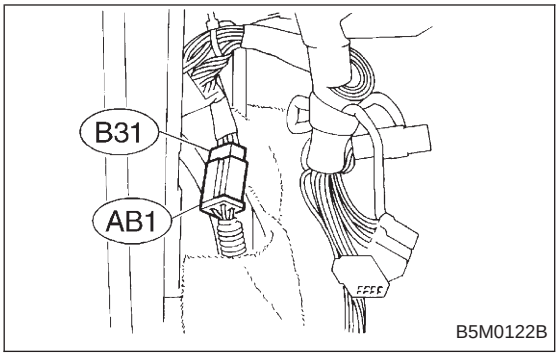
2. BODY HARNESS INSPECTION

Turn ignition switch "ON" (engine off) to make sure other warning lights (in combination meter) illuminate.

CHECK ***: Do all the warning lights (in combination meter) except airbag warning light come on?***

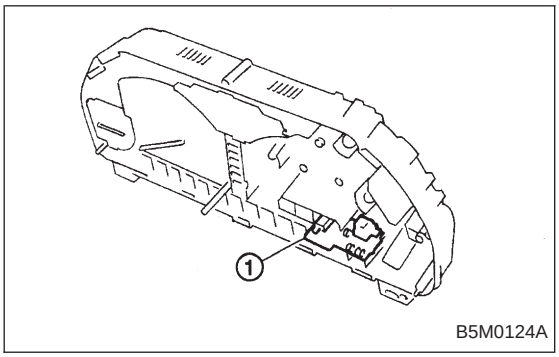
YES : Go to step **3**.

NO : Repair body harness.



3. AIRBAG WARNING LIGHT MODULE (IN COMBINATION METER) INSPECTION

1) Turn ignition switch “OFF”, disconnect battery ground cable and then wait at least 20 seconds.
2) Disconnect body harness connector (B31) from connector (AB1).

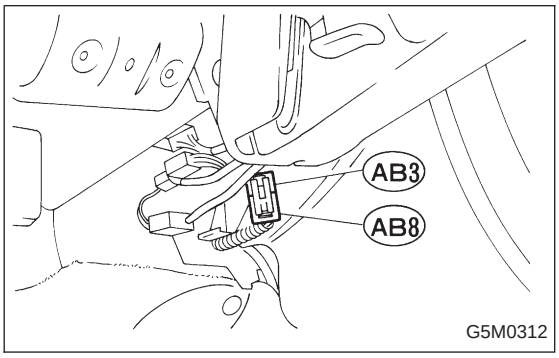


3) Connect battery ground cable and turn ignition switch “ON” (engine off) to make sure airbag warning light illuminates.

CHECK ***: Does the airbag warning light come on?***

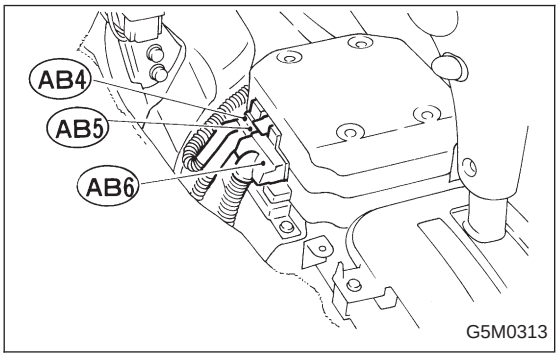
YES : Go to step **4**.

NO : Replace airbag warning light module ①.



4. AIRBAG MAIN HARNESS INSPECTION

1) Turn ignition switch “OFF”, disconnect battery ground cable and then wait at least 20 seconds.
2) Connect body harness connector (B31) and connector (AB1).
3) Disconnect connectors (AB3) and (AB8) below steering column. <Ref. to 5-5 [M2-6].>



4) Disconnect connector (AB6) from airbag control module. <Ref. to 5-5b [W5A0].>

5) Connect battery ground cable and turn ignition switch “ON” to make sure airbag warning light illuminates.

CHECK ***: Does the airbag warning light come on?***

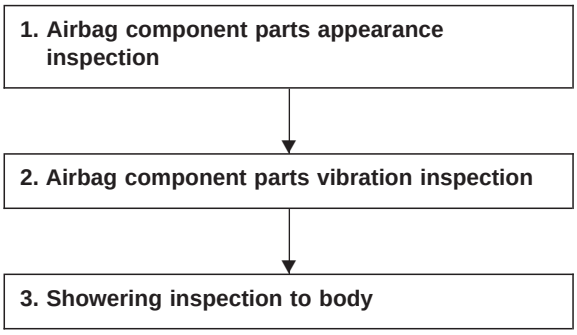
YES : Replace airbag control module.

NO : Replace airbag main harness.

P: WARNING LIGHT INDICATES TROUBLE CODE, THEN NORMAL CODE.
— FLASHING TROUBLE CODE. —

DIAGNOSIS:

- Airbag system component parts are faulty.



CAUTION:
Before performing diagnostics on airbag system, turn ignition switch “OFF”, disconnect battery ground cable, and then wait at least 20 seconds.

1. AIRBAG COMPONENT PARTS APPEARANCE INSPECTION

1) Conduct on-board diagnostic and call up trouble codes stored in memory. <Ref. to 5-5b [T4B0].>

2) Select trouble code required to check airbag component parts from those listed in table and reproduce symptom.

Trouble codes	Check parts	Refer to 5-5b:
04	● Airbag module (Passenger) ● Airbag main harness ● Airbag control module	W3A2 W4A0 W5A0
11	● Fuse No. 8 ● Airbag main harness ● Airbag control module ● Body harness	T5D3 W4A0 W5A0 —
12	● Roll connector ● Airbag module (Driver) ● Airbag main harness ● Airbag control module	W6A0 W3A1 W4A0 W5A0
13	● Airbag module (Driver) ● Roll connector ● Airbag main harness ● Airbag control module	W3A1 W6A0 W4A0 W5A0
21	● Airbag control module	W5A0
22	● Airbag module (Passenger) ● Airbag main harness ● Airbag control module	W3A2 W4A0 W5A0
33	● Airbag control module	W5A0
34	● Airbag main harness ● Airbag module (Passenger) ● Airbag control module	W4A0 W3A2 W5A0
41	● Airbag module (Driver) ● Roll connector ● Airbag main harness ● Airbag control module	W3A1 W6A0 W4A0 W5A0
42	● Airbag module (Passenger) ● Airbag main harness ● Airbag control module	W3A2 W4A0 W5A0
43	● Airbag module (Driver) ● Roll connector ● Airbag main harness ● Airbag control module	W3A1 W6A0 W4A0 W5A0

3) Conduct appearance inspection on parts selected.

CHECK ***: Is there anything unusual about the appearance of airbag component parts?***

YES : Replace faulty airbag component parts.

NO : Go to step **2**.

NOTE:
Also check connector terminals, wiring harness, case, etc. for damage.

2. AIRBAG COMPONENT PARTS VIBRATION INSPECTION

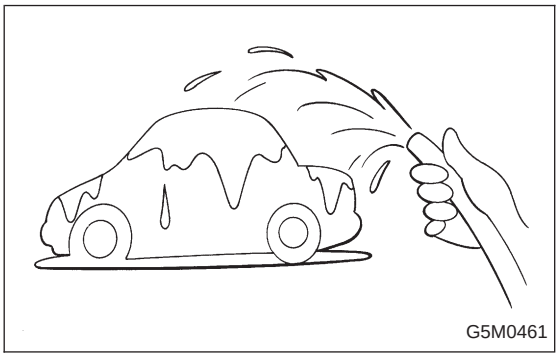
1) Gently shake check parts (to determine faults.).
2) To check airbag module or roll connector, turn and tilt steering wheel.

CAUTION:
Do not shake or vibrate airbag control module.

CHECK ***: Does the component malfunction again when shaking?***

YES : Replace faulty airbag component parts.

NO : Go to step **3**.


G5M0461

3. SHOWERING INSPECTION TO BODY

Spray water on vehicle body.

CAUTION:
Do not directly spray water on airbag components.

CHECK ***: Does water leak into the passenger compartment when showering vehicle?***

YES : Replace faulty airbag component parts.

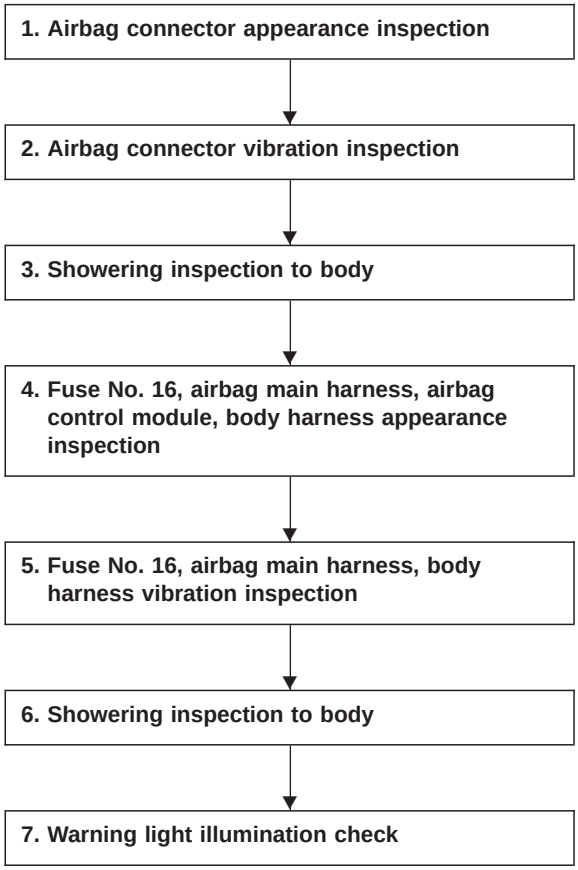
NO : Clear memory.

NOTE:
Also check wiring harnesses as water may leak along them and get airbag component parts wet.

Q: WARNING LIGHT INDICATES TROUBLE CODE, THEN NORMAL CODE. — FLASHING NORMAL CODE. —

DIAGNOSIS:

- Airbag connector is faulty.
- Fuse No. 16 is blown.
- Airbag main harness is faulty.
- Airbag control module is faulty.
- Body harness is faulty.



CAUTION:
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable, and then wait at least 20 seconds.

1. AIRBAG CONNECTOR APPEARANCE INSPECTION

Conduct appearance inspection on airbag connectors (AB2) through (AB8). <Ref. to 5-5b [T100].>

CHECK ***: Is there anything unusual about the appearance of connectors (AB2) through (AB8)?***

YES : Replace faulty airbag component parts.

NO : Go to step **2**.

NOTE:
Check terminals, case and wiring harnesses for damage.

2. AIRBAG CONNECTOR VIBRATION INSPECTION

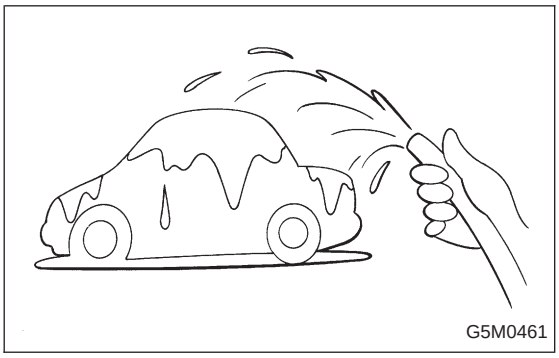
Conduct vibration inspection on airbag connectors (AB2) through (AB8). <Ref. to 5-5b [T100].>

CHECK ***: Do the connectors (AB2) through (AB8) malfunction again when shaking?***

YES : Replace faulty airbag component parts.

NO : Go to step **3**.

NOTE:
Gently shake each airbag connector.


G5M0461

3. SHOWERING INSPECTION TO BODY

Spray water on vehicle body.

CAUTION:
Do not directly spray water on airbag components.

CHECK ***: Does water leak into the passenger compartment when showering vehicle?***

YES : Replace faulty airbag component parts.

NO : Go to step **4**.

NOTE:
If leaks are noted, also check wiring harnesses as water may leak along them and wet airbag connectors.

4. FUSE No. 16, AIRBAG MAIN HARNESS, AIRBAG CONTROL MODULE, BODY HARNESS APPEARANCE INSPECTION

Conduct appearance inspection on fuse No. 16 <Ref. to 5-5b [T5H3].>, airbag main harness <Ref. to 5-5b [W4A0].>, airbag control module <Ref. to 5-5b [W5A0].> and body harness.

CHECK ***: Is there anything unusual about the appearance of fuse No. 16, airbag main harness, airbag control module or body harness?***

YES : Replace faulty airbag component parts.

NO : Go to step **5**.

NOTE:
Also check connectors, terminals, wiring harness and case for damage.

5. FUSE No. 16, AIRBAG MAIN HARNESS, BODY HARNESS VIBRATION INSPECTION

Conduct vibration inspection on fuse No. 16, airbag main harness and body harness.

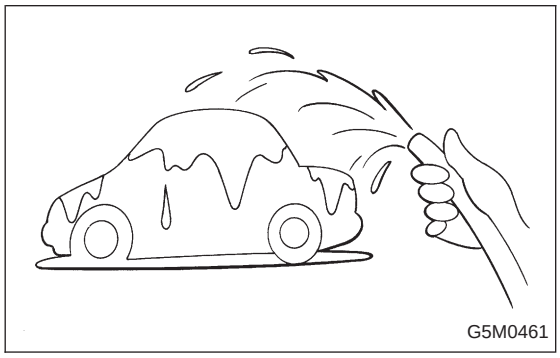
CAUTION:
Do not shake or vibrate airbag control module.

CHECK ***: Do fuse No. 16, airbag main harness or body harness malfunction again when shaking?***

YES : Replace faulty airbag component parts.

NO : Go to step **6**.

NOTE:
Gently shake each part.


G5M0461

6. SHOWERING INSPECTION TO BODY

Spray water on vehicle body.

CAUTION:
Do not directly spray water on each part.

CHECK ***: Does water leak into the passenger compartment when showering vehicle?***

YES : Replace faulty airbag component parts.

NO : Go to step **7**.

NOTE:
If leaks are noted, check wiring harnesses as water may leak along them and get parts wet.

7. WARNING LIGHT ILLUMINATION CHECK

Turn ignition switch “ON” (engine off) and observe airbag warning light.

CHECK ***: Does the airbag warning light comes on for about 7 seconds, then go out and stay out?***

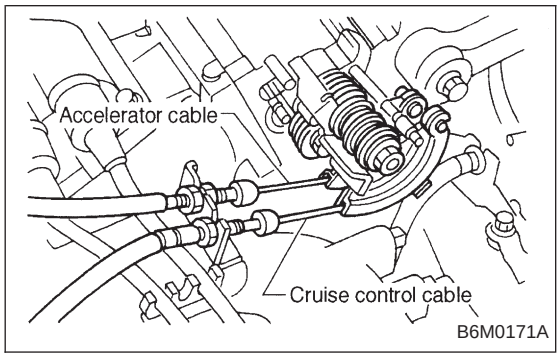
YES : Clear memory.

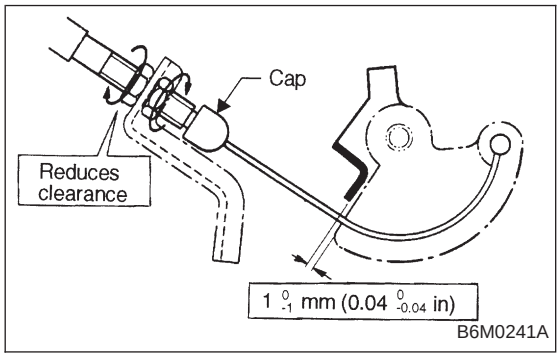
NO : Go to “DIAGNOSTICS PROCEDURE”. <Ref. to 5-5b [T4E0].>

1. Supplemental Restraint System “Airbag”

Airbag system wiring harness is routed near the cruise control command switch.

CAUTION:
● All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuits.
● Be careful not to damage Airbag system wiring harness when servicing the cruise control command switch.





2. Pre-inspection

1. CRUISE CONTROL CABLE

1) Cable installation
   (1) Ensure that cruise control cable is attached to the left of accelerator cable (on accelerator pedal side).
   (2) Ensure that accelerator cable throttle cam does not move when cruise control throttle cam is moved by hand.
   (3) Ensure that throttle cam moves smoothly.
2) Cable free play
   (1) Ensure that throttle cam-to-lever clearance is within specifications.

Standard value: 1 $^{0}_{-1}$ mm (0.04 $^{0}_{-0.04}$ in)

NOTE:
If clearance is not within specifications, adjust cable at its outer end.

   (2) Ensure that cap is positioned in groove.

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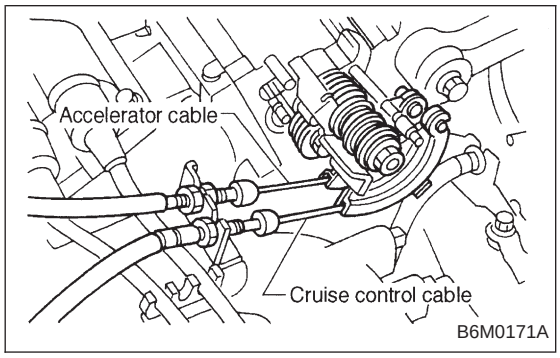

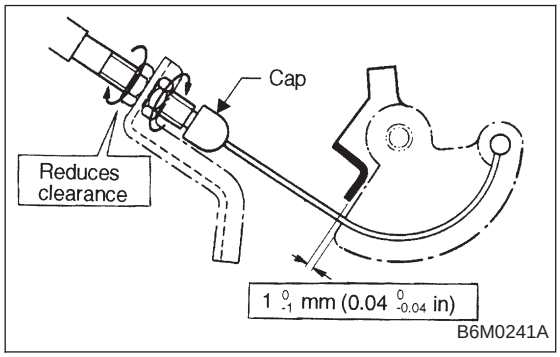

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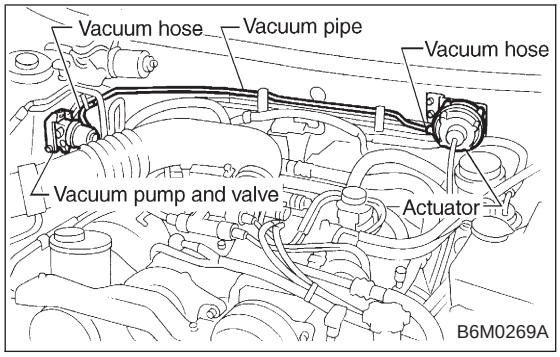
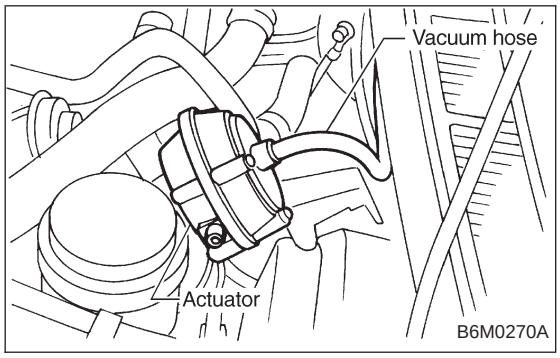


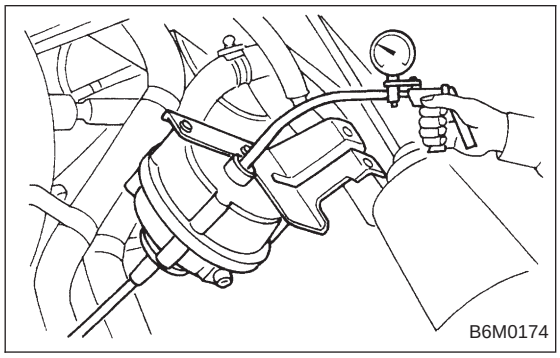
2. VACUUM HOSE AND PIPE

Check vacuum hose and pipe (which connects actuator and vacuum pump) for disconnection or cracks.



3. ACTUATOR

1) Disconnect vacuum hose from actuator.



2) Connect vacuum pump as shown in figure.
3) Make sure that cruise control cable moves smoothly and quickly when a vacuum pressure of 40.0 kPa (300 mmHg, 11.81 inHg) is applied to actuator.

Stroke: 35 mm (1.38 in)

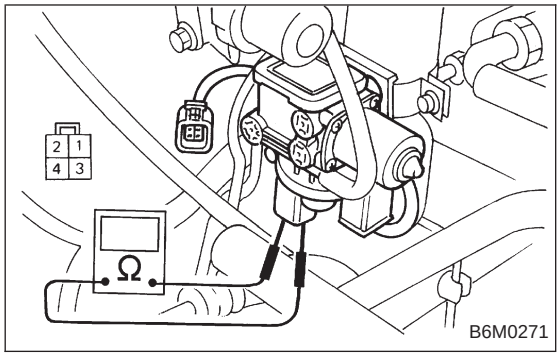
4) When vacuum pressure is released from condition 3) above, make sure the cable returns to its original position smoothly and quickly.
5) After inspection, disconnect vacuum pump and connect vacuum hose.

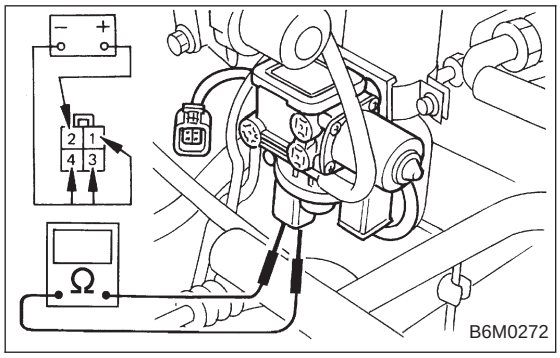
4. POWER SUPPLY

1) Measure battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V
Specific gravity: Above 1.260

2) Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.





5. VACUUM PUMP AND VALVE

1) Measure resistance of vacuum pump and valve.
   (1) Disconnect connector from vacuum pump and valve.
   (2) Measure resistance between each terminal of vacuum pump and valve.

Terminals / Specified resistance:
No. 2 — No. 3 / 100 Ω or less (Vacuum pump motor)
No. 2 — No. 1 / 69 Ω (Air valve)
No. 2 — No. 4 / 69 Ω (Release valve)

2) Check for leakage and sticking of vacuum valve.
   (1) Disconnect connector from vacuum pump and valve.
   (2) Make sure that cruise control cable moves smoothly when connecting + (positive) battery cable to terminal No. 2 and − (negative) battery cable to terminals No. 1, 3 and 4 of vacuum pump and valve connector.

Stroke: 35 mm (1.38 in)
Movement time: Within 3 seconds

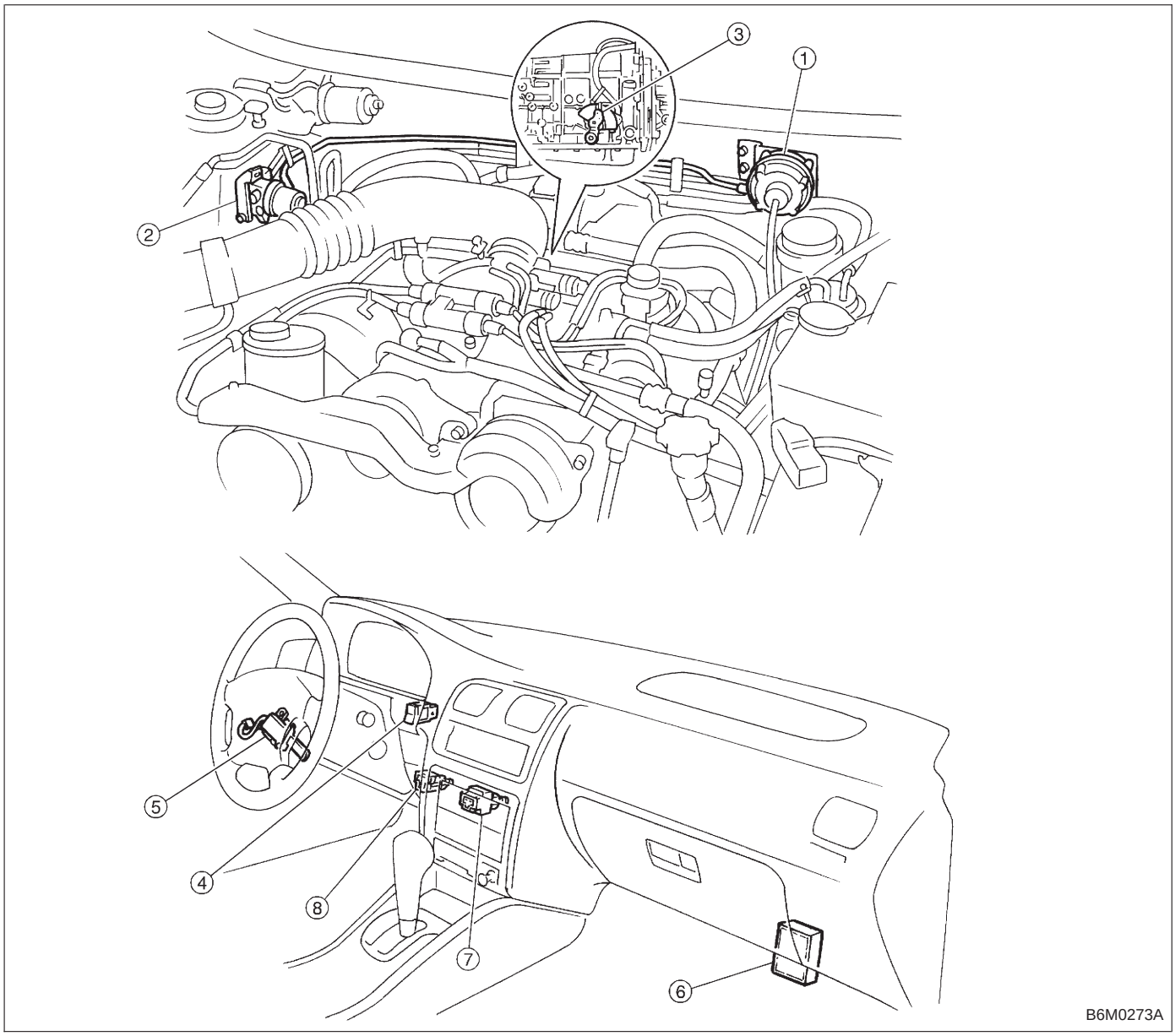
   (3) When the battery cable is disconnected from condition (2) above, make sure the cable returns to its original position smoothly.

Movement time: Within 1.5 seconds

   (4) Connect battery to each terminal and check cable movement.

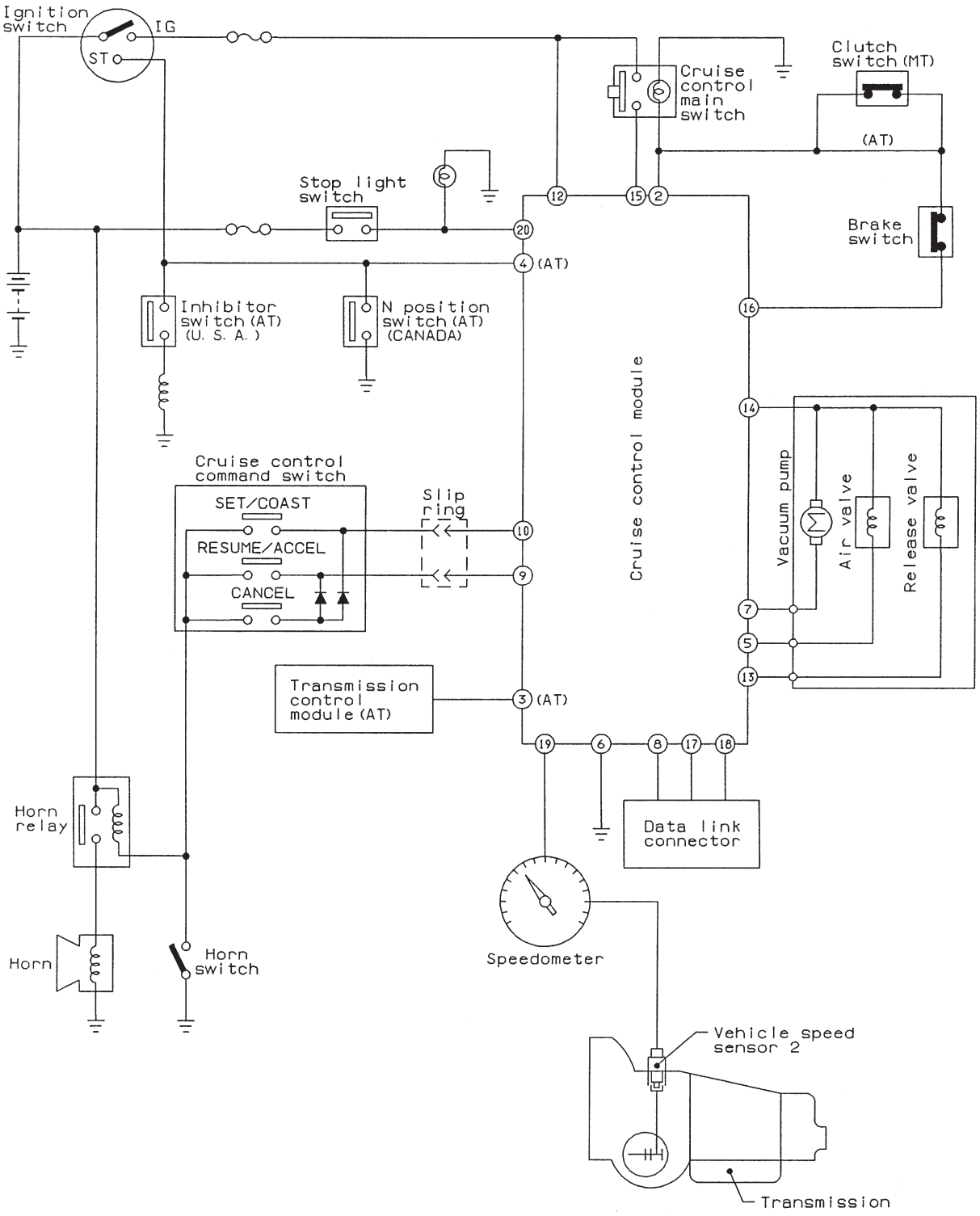
Terminal No.				Battery		Cruise control cable operation
1	2	3	4	⊕	⊖	
—	—	—	—	—	—	—
	○			○		Pull
		○			○	
○					○	
			○		○	
	○			○		Hold
○					○	
			○		○	
	○			○		Release
			○		○	

3. Electrical Components Location

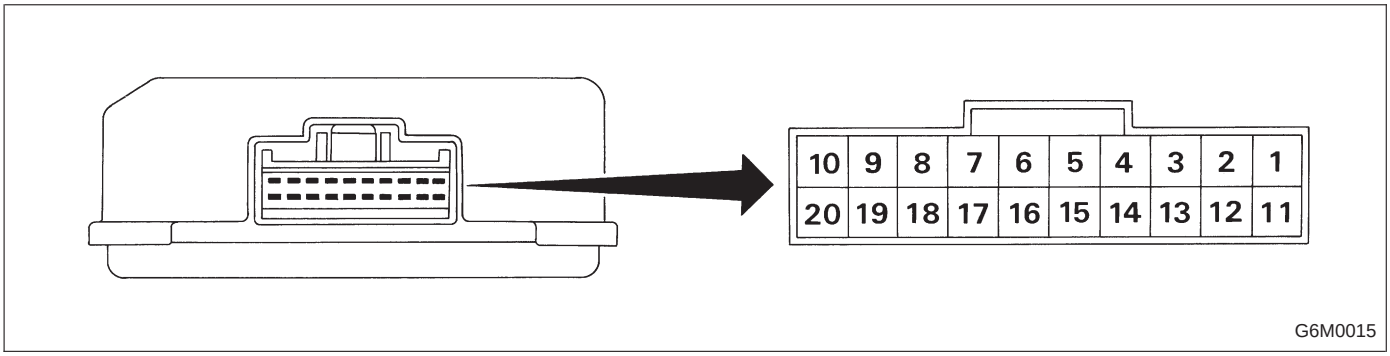


① Actuator
② Vacuum pump and valve
③ Inhibitor switch (AT)
④ Cruise control main switch
⑤ Cruise control command switch
⑥ Cruise control module
⑦ Stop and brake switch
⑧ Clutch switch (MT)

4. Schematic


Ignition switch
IG
ST
Cruise control main switch
Clutch switch (MT)
(AT)
Stop light switch
Brake switch
Inhibitor switch (AT) (U. S. A.)
N position switch (AT) (CANADA)
Cruise control module
Cruise control command switch
SET/COAST
RESUME/ACCEL
CANCEL
Slip ring
Vacuum pump
Air valve
Release valve
Transmission control module (AT)
Horn relay
Horn
Horn switch
Data link connector
Speedometer
Vehicle speed sensor 2
Transmission
B6M0274

5. Control Module I/O Signal

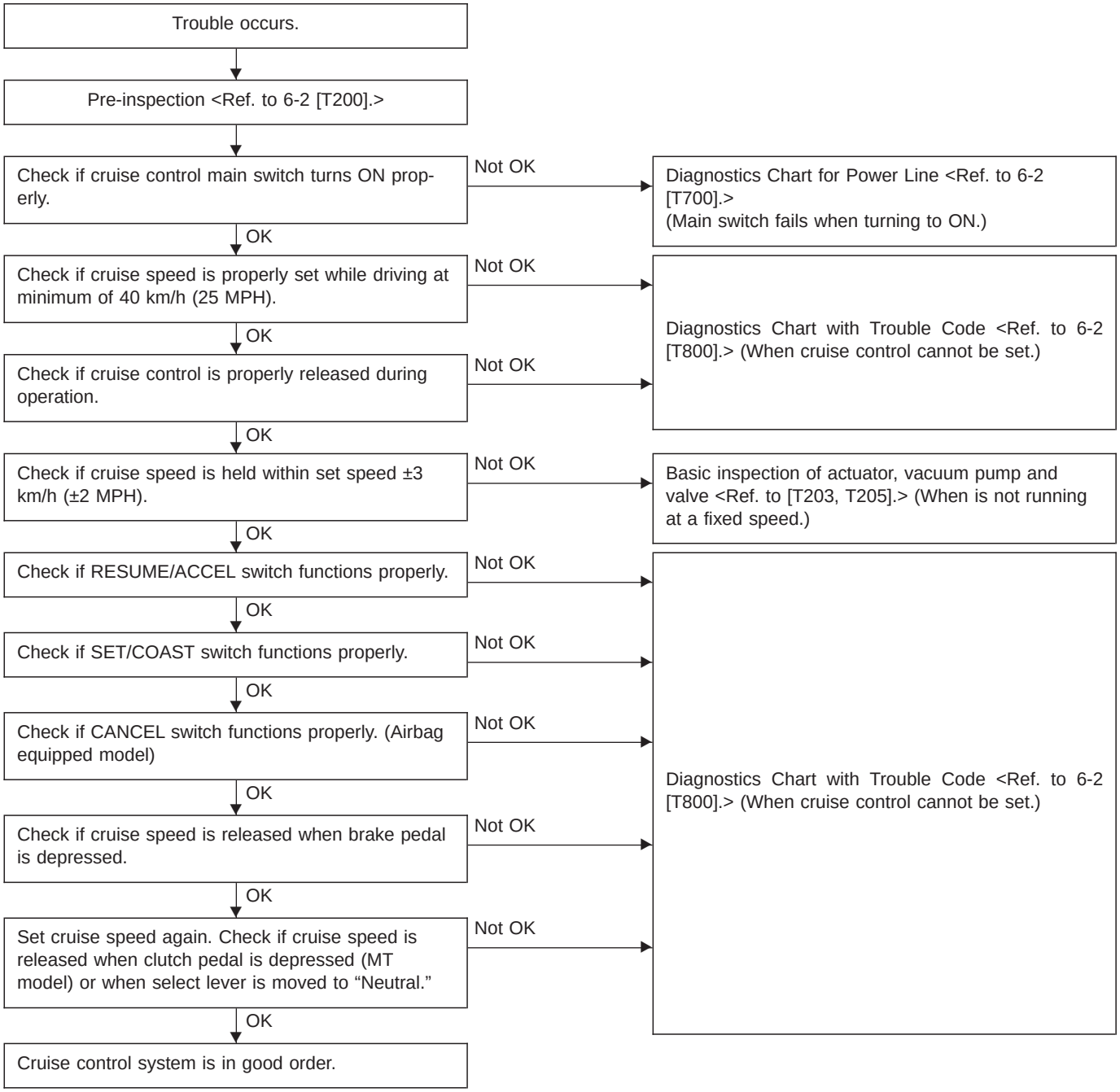


Content	Terminal No.	Measuring conditions and I/O signals (ignition switch ON and engine idling)
Main power supply	2	● Battery voltage is present when main power is turned ON. ● “0” volt is present when main power is turned OFF.
Inhibitor switch (AT) (U.S.A.) N position switch (AT) (CANADA)	4	● “0” volt is present when selector lever is set to P or N position (CANADA: N position only). ● Battery voltage is present when selector lever is other than P or N position (CANADA: N position only).
Air valve	5	● “0” volt is present when vehicle is stopped. ● ON-and-OFF (“0”-and-battery voltage) operation is alternately repeated while cruise control is operating.
GND	6	—
Vacuum pump motor	7	● “0” volt is present when vehicle is stopped. ● ON-and-OFF (“0”-and-battery voltage) operation is alternately repeated while cruise control is operating.
Data link connector	8	—
RESUME/ACCEL switch	9	● Battery voltage is present when switch is turned ON. ● “0” volt is present when switch is turned OFF.
SET/COAST switch	10	● Battery voltage is present when switch is turned ON. ● “0” volt is present when switch is turned OFF.
Ignition switch	12	● Battery voltage is present when ignition switch is turned ON. ● “0” volt is present when ignition switch is turned OFF.
Release valve	13	● “0” volt is present when vehicle is stopped. ● ON-and-OFF (“0”-and-battery voltage) operation is alternately repeated while cruise control is operating.
Power supply to vacuum pump motor, air valve, release valve	14	● “0” volt is present when vehicle is stopped. ● Battery voltage is present while cruise control is operating.
Cruise main switch	15	● Battery voltage is present during pressing the main switch, and then approx. 12 V is present while switch is turned ON. ● “0” volt is present when switch is turned OFF.
Brake switch	16	Turn the cruise main switch to ON and leave clutch pedal released (MT). Then check that; ● “0” volt is present when brake pedal is depressed. ● Battery voltage is present when brake pedal is released. Additionally only in MT vehicle, keep the cruise main switch to ON and leave brake pedal released. Then check that; ● “0” volt is present when clutch pedal is depressed. ● Battery voltage is present when clutch pedal is released.
Data link connector	17	—
Data link connector	18	—
Vehicle speed sensor 2	19	Lift-up the vehicle until all four wheels are raised off ground, and then rotate any wheel manually. Approx. 5 and 0 volt pulse signals are alternately input to cruise control module.
Stop light switch	20	Turn ignition switch to OFF. Then check that; ● Battery voltage is present when brake pedal is depressed. ● “0” volt is present when brake pedal is released.

NOTE:
Voltage at terminals 5, 7, 13 and 14 cannot be checked unless vehicle is driving by cruise control operation.

6. Diagnostics Chart for On-board Diagnosis System

A: BASIC DIAGNOSTICS PROCEDURE



B: ON-BOARD DIAGNOSIS WITH SELECT MONITOR

1. GENERAL

The on-board diagnosis function of the cruise control system uses an external select monitor.
The on-board diagnosis function operates in two categories, which are used depending on the type of problems;

- Cruise cancel conditions diagnosis
- Real-time diagnosis

Applicable cartridge No.: 498349601

- Cruise cancel conditions diagnosis

This category of diagnosis requires actual vehicle driving in order to determine the cause, (as when cruise speed is cancelled during driving although cruise cancel condition is not entered).

⇩

Cruise control module memory stores the cancel condition (Code No.) which occurred during driving. When there are plural cancel conditions (Code No.), they are shown in order, for 2 seconds per Code No., on the select monitor.

CAUTION:
● The cruise control memory stores not only the cruise "cancel" which occurred (although "cancel" operation is not entered by the driver), but also the "cancel" condition input by the driver.
● The content of memory is cleared when ignition switch or cruise main switch is turned OFF.

- Real-time diagnosis

The real-time diagnosis function is used to determine whether or not the input of output signal system is in good order, according to signal emitted from switches, sensors, etc.

Vehicle cannot be driven at cruise speed because problems occurs in the cruise control system or its associated circuits.

⇩

Monitor the signal conditions from switches and sensors.

2. CRUISE CANCEL CONDITIONS DIAGNOSIS

1) Connect select monitor.
2) Start the engine and turn cruise control main switch to ON.
3) Set select monitor in “FB0” mode.
4) Drive vehicle at least 40 km/h (25 MPH) with cruise speed set.
5) If cruise speed is canceled itself (without doing any cancel operations), a trouble code will appear on select monitor display.

CAUTION:
- **A trouble code will also appear when cruise cancel is effected by driver. Do not confuse.**
- **Have a co-worker ride in vehicle to assist in diagnosis during driving.**

NOTE:
Trouble code will be cleared by turning ignition switch or cruise control main switch to OFF.

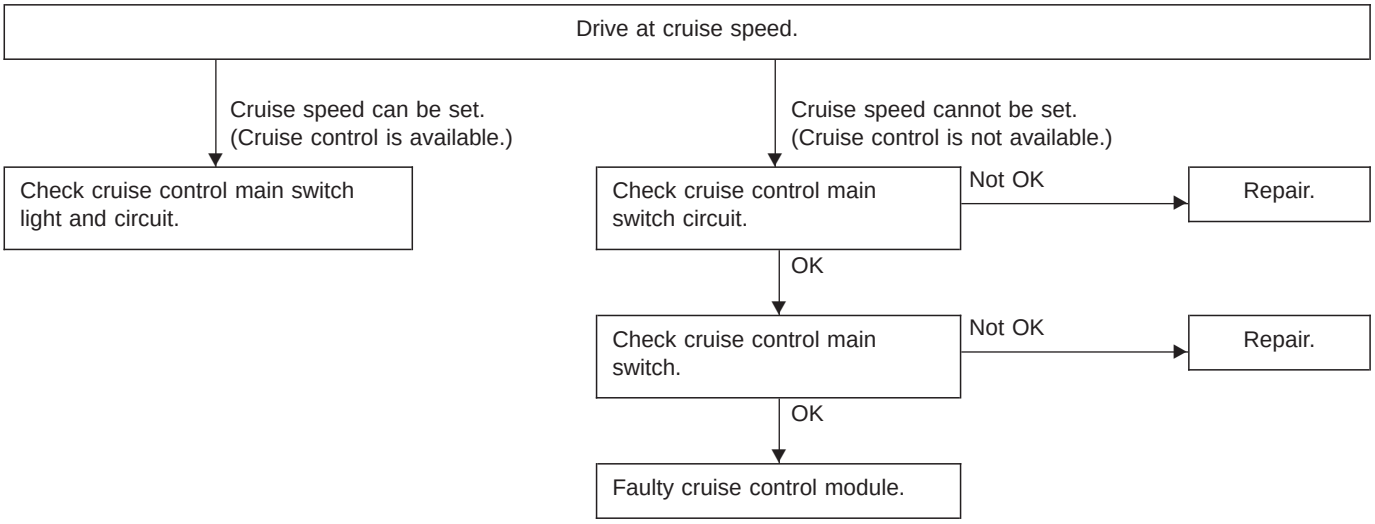
3. REAL-TIME DIAGNOSIS

1) Connect select monitor.
2) Turn ignition switch and cruise control main switch to ON.
3) Set select monitor in “FA0” mode.
4) Ensure that normal indication is displayed when controls are operated as indicated below:

- When SET/COAST switch is pressed.
- When RESUME/ACCEL switch is pressed.
- When brake pedal is depressed. (Stop and brake switch turns ON.)
- When clutch pedal is depressed. (MT model)
- When select lever is set to N position. (AT model)

7. Diagnostics Chart for Power Line

A: BASIC DIAGNOSTICS PROCEDURE



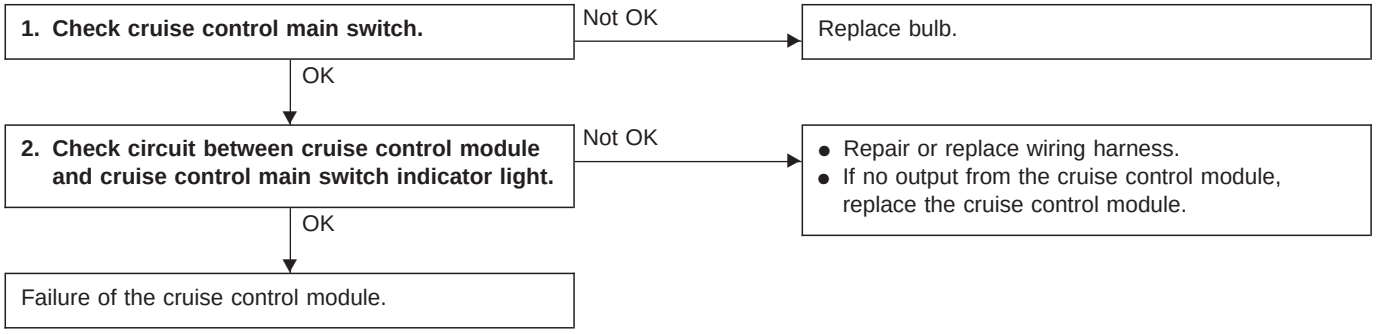
B: CHECK INDICATOR AND CIRCUIT IN CRUISE CONTROL MAIN SWITCH

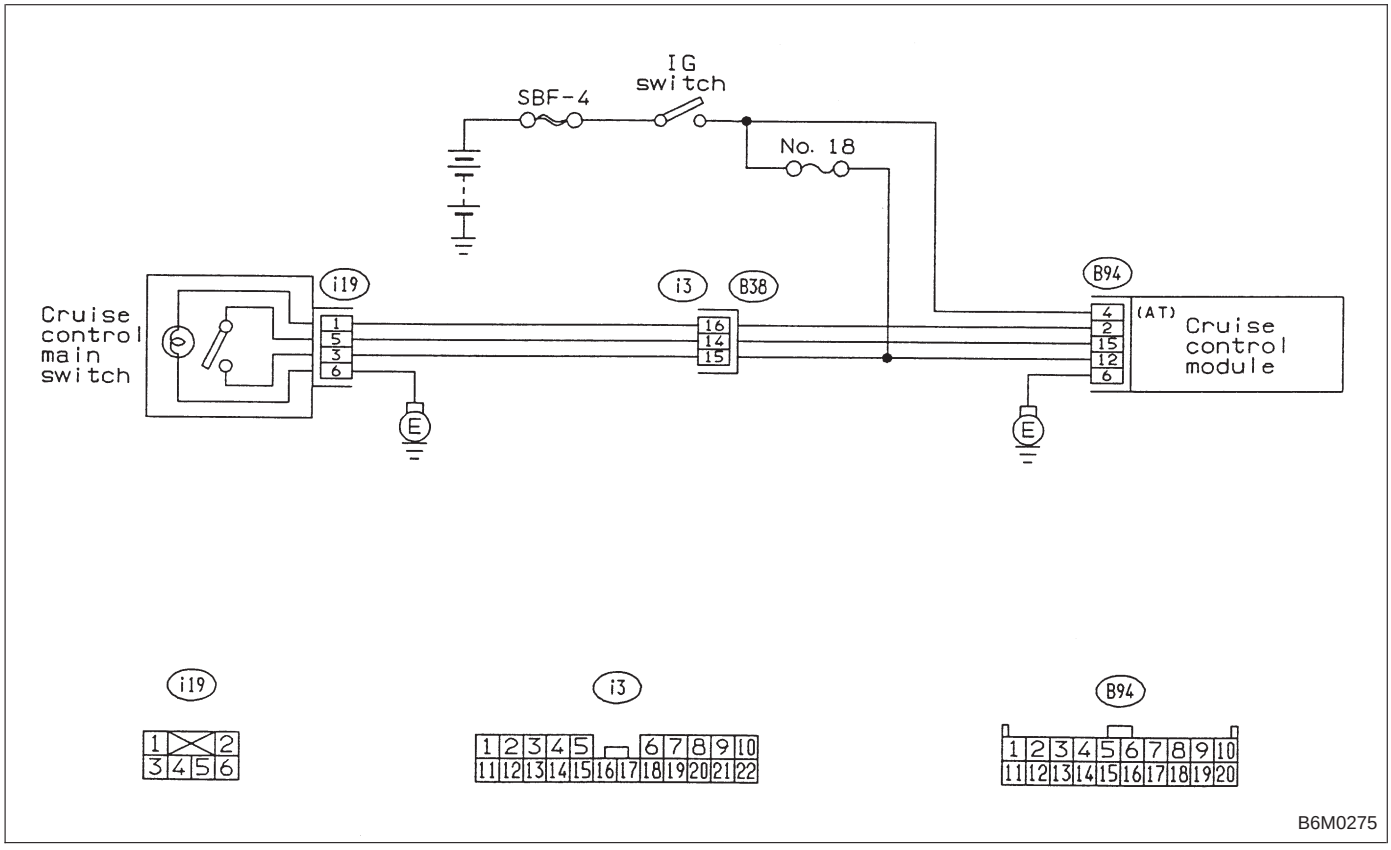
DIAGNOSIS:

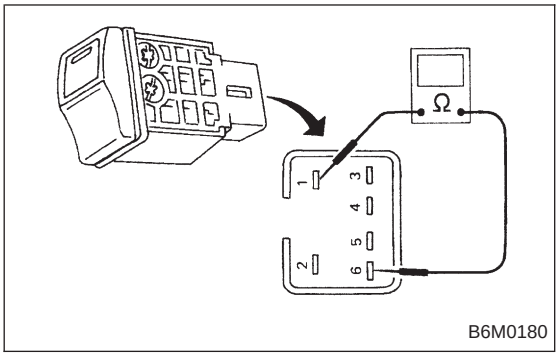
● Bulb failure or open harness of the indicator circuit in the cruise control main switch.

TROUBLE SYMPTOM:

● Cruise control can be set, normally indicator does not come on. (When main switch is pressed.)





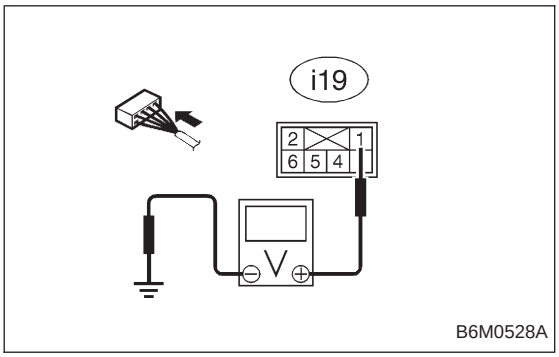


B6M0180

1. CHECK CRUISE CONTROL MAIN SWITCH.

1) Remove cruise control main switch.
2) Measure resistance between cruise control main switch terminals.

Terminals / Specified resistance:
No. 1 — No. 6 / Approx. 50 Ω



B6M0528A

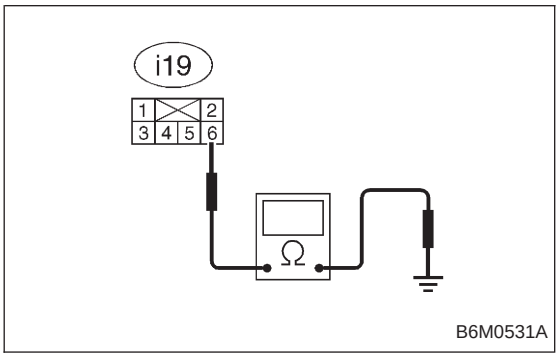
2. CHECK CIRCUIT BETWEEN CRUISE CONTROL MODULE AND CRUISE CONTROL MAIN SWITCH INDICATOR LIGHT.

1) Turn the ignition switch to ON.
2) Turn cruise control main switch to ON.
3) Measure voltage between cruise control main switch connector and the body.

Connector & terminal / Specified voltage:
(i19) No. 1 — Body / 10 V, or more

4) Turn the ignition switch and cruise control main switch to OFF.
5) Remove the connector from the cruise control main switch.
6) Measure resistance of ground circuit between the cruise control main switch connector and body.

Connector & terminal / Specified resistance:
(i19) No. 6 — Body / 10 Ω, max.



B6M0531A

C: CHECK CRUISE CONTROL MAIN SWITCH

DIAGNOSIS:

● Faulty cruise control main switch, or open harness.

TROUBLE SYMPTOM:

● Cruise control main switch is not turned ON and cruise control cannot be set.

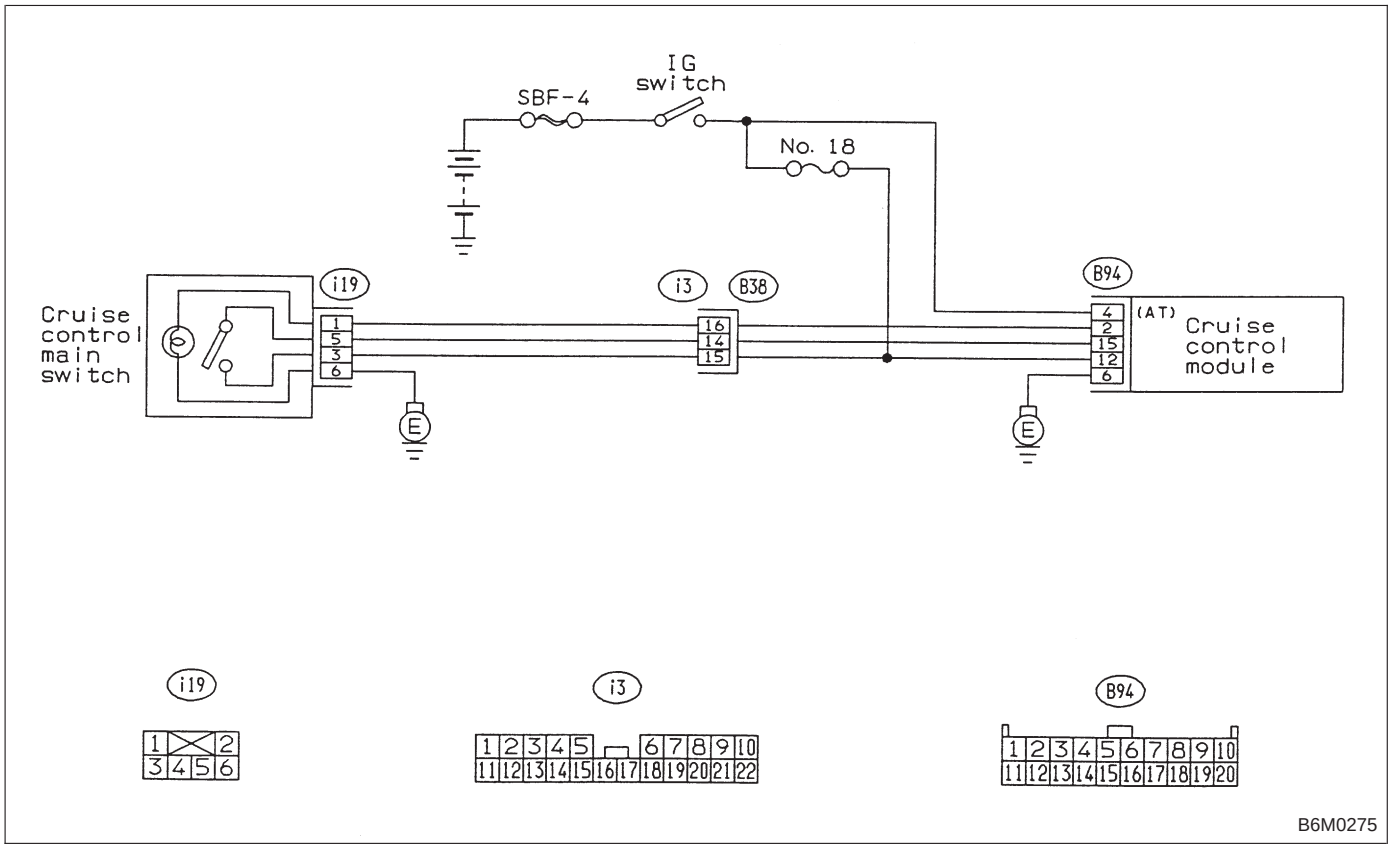
NOTE:
When the main relay (built-in cruise control module) operates, the main switch circuit is in normal condition.
The main relay operation can be checked by hearing the operation sounds.
This operation sounds will be heard when ignition switch and cruise control main switch is turned to ON.

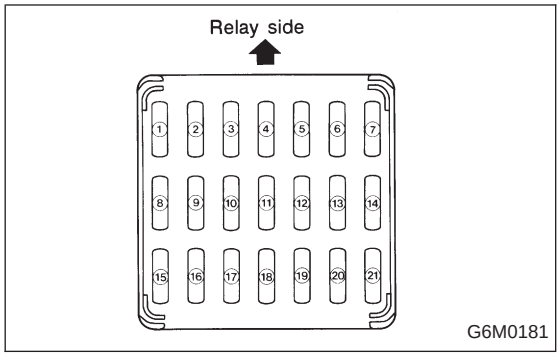
1. Check fuse and power supply.
- Not OK → Melted fuse → repair the shorted part of the circuit. → replace fuse.
- OK ↓

2. Check cruise control main switch.
- Not OK → Open harness → repair faulty main switch. → replace.
- OK ↓

3. Check harness connector between cruise control main switch and cruise control module.
- Not OK → Repair or replace wiring harness.
- OK ↓

Failure of the cruise control module.

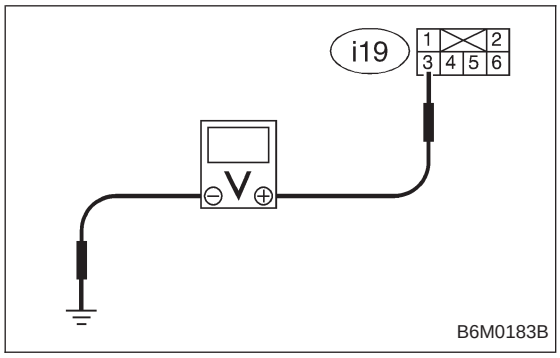




1. CHECK FUSE AND POWER SUPPLY.

1) Check fuse No. 18.
2) Turn ignition switch to ON.
3) Measure voltage between fuse box connector and body.

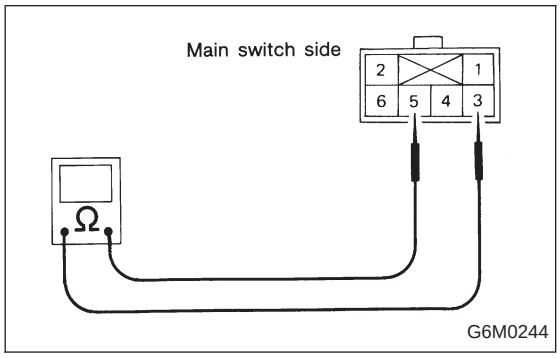
Connector & terminal / Specified voltage:
(B51) No. 4 — Body / 10 V, or more



2. CHECK CRUISE CONTROL MAIN SWITCH.

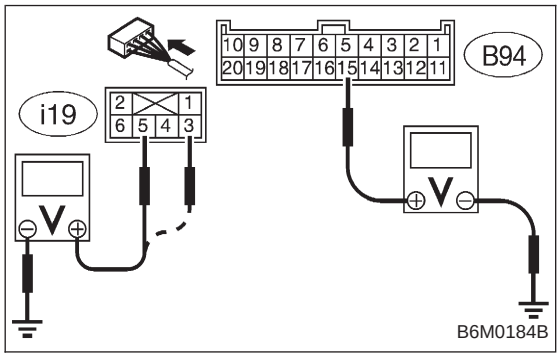
1) Turn ignition switch to OFF.
2) Remove cruise control main switch and disconnect connector.
3) Turn ignition switch to ON.
4) Measure voltage between cruise control main switch connector and body.

Connector & terminal / Specified voltage:
(i19) No. 3 — Body / 10 V, or more



5) Measure resistance between cruise control main switch terminals.

Terminals / Specified resistance:
No. 3 — No. 5 / 10 Ω, max. (ON)
1 MΩ, min. (OFF)



3. CHECK HARNESS CONNECTOR BETWEEN CRUISE CONTROL MAIN SWITCH AND CRUISE CONTROL MODULE.

1) Connect connector.
2) Turn ignition switch to ON.
3) Turn cruise control main switch to ON.
4) Measure voltage between each terminal of cruise control main switch or cruise control module and body.

Connector & terminal / Specified voltage:
(i19) No. 3 — Body / 10 V, or more
(i19) No. 5 — Body / 10 V, or more
(B94) No. 15 — Body / 10 V, or more

NOTE:
Depress cruise control main switch with fingers while measuring (i19) No. 5 — Body.

8. Diagnostics Chart with Trouble Code

A: TROUBLE CODE

Trouble code	Item	Contents of diagnosis	Page
10	OK	Normal	18
11	BRAKE/ST/CL or N	● Input signals from brake switch “OFF”, stop light switch “ON” (Brake pedal is in depressed condition.) ● Input signals from clutch switch “OFF”, or inhibitor switch is in “N” position. [Clutch pedal is depressed (MT), or select lever is set to N position (AT).]	20
12	NOT SET SP	Out of cruise speed range	22
13	LOW SP LIM	Low-speed control limiter	22
14	CANCEL SW	Input signal from cancel switch	26
15	NO MEMORY	No memorized cruise speed	—
21	SP SENS NG	Faulty vehicle speed sensor 2	22
22	COM SW NG	Faulty SET/COAST switch or RESUME/ACCEL switch	26
23	RELAY NG	Faulty safety relay included in cruise control module	29
24	CPU RAM NG	Faulty CPU RAM included in cruise control module	29
31	MOTOR NG	Faulty vacuum motor or motor drive system	30
32	AIR VAL NG	Faulty air valve or valve drive system	30
33	REL VAL NG	Faulty release valve or valve drive system	30

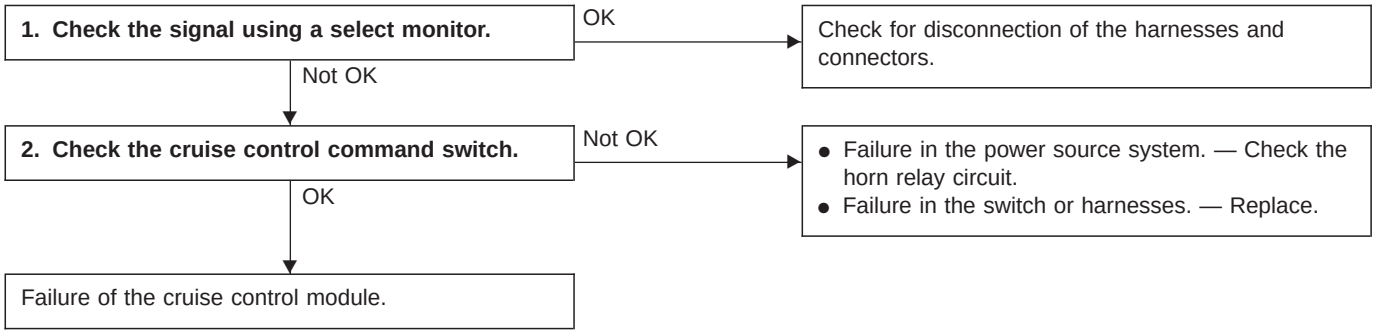
B: TROUBLE CODE 10 — NORMAL CONDITION —

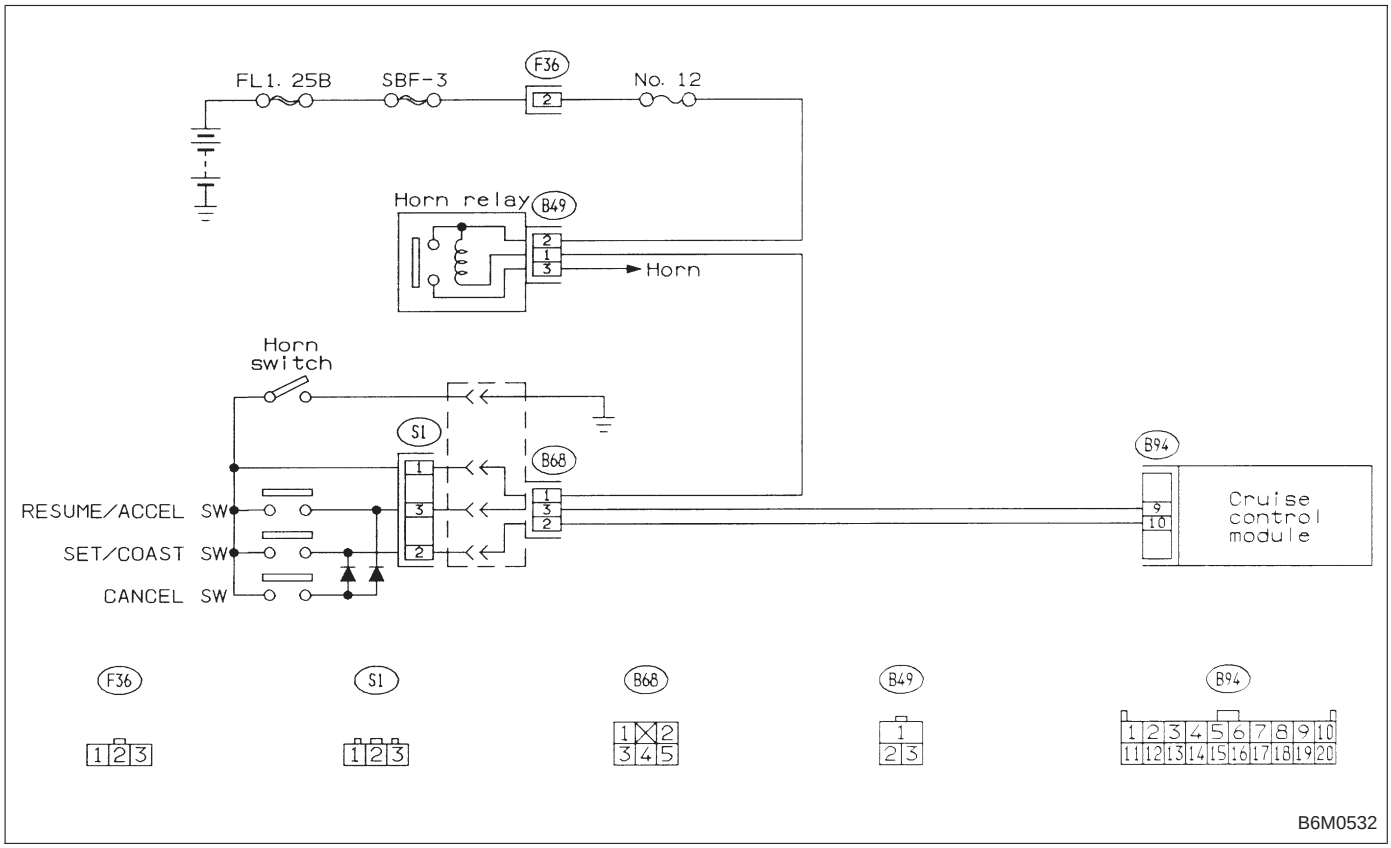
DIAGNOSIS:

- SET/COAST switch or disconnection of the wiring or short circuit.
- RESUME/ACCEL switch or disconnection of the wiring or short circuit.

TROUBLE SYMPTOM:

- Cruise control cannot be set, or it is cancelled immediately.
- RESUME/ACCEL cannot be operated.





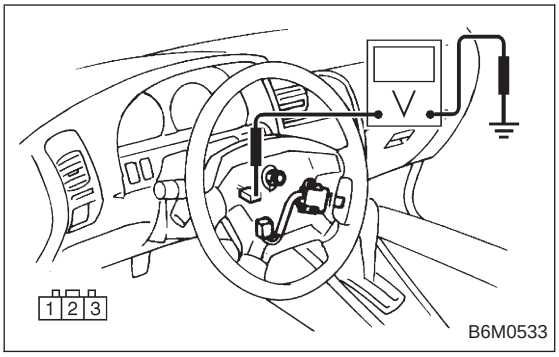
LED No.	Signal name	Display
1	SET/COAST switch	SE
2	RESUME/ACCEL switch	RE
3	Stop light switch	ST
4	● Brake switch ● Clutch switch (MT)	BR
5	Inhibitor switch (AT)	N
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—

SE	RE	ST	BR	N
—	—	—	—	—

1	2	3	4	5
6	7	8	9	10

1. CHECK THE SIGNAL USING A SELECT MONITOR.

1) Turn ignition switch to ON.
2) Turn cruise control main switch to ON.
3) Set select monitor in “FA0” mode.
4) Check signals for proper operation.
   (1) When pushing the SET switch:
   LED No. 1 goes out — lights.
   (2) When pushing the RESUME switch:
   LED No. 2 goes out — lights.



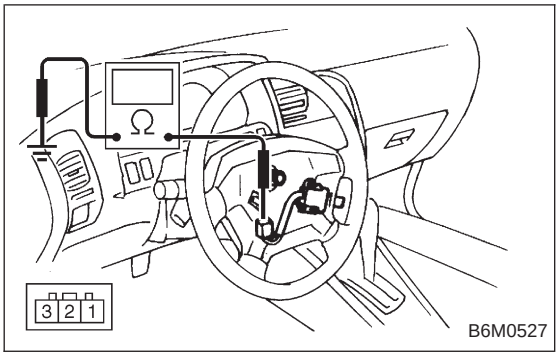
2. CHECK THE CRUISE CONTROL COMMAND SWITCH.

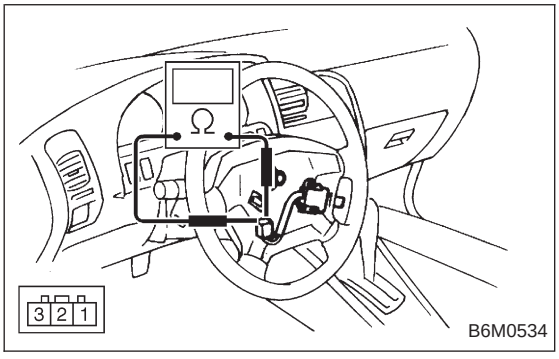
1) Disconnect connector from command switch.
2) Measure voltage between connector (S1) and body.

Connector & terminal / Specified voltage:
(S1) No. 1 — Body / 10 V, or more

3) Check for harness short circuit between command switch and body.

Terminals / Specified resistance:
No. 2 — Body / 1 MΩ, min.
No. 3 — Body / 1 MΩ, min.





4) Measure resistance between each terminal of switch side connector to check the switch operation.

Terminals:
No. 1 — No. 2 (SET/COAST SWITCH)
No. 1 — No. 3 (RESUME/ACCEL SWITCH)

Specified resistance:
10 Ω, max. (ON)
1 MΩ, min. (OFF)

CANCEL (FB0)

11 BRAKE/ST/CL or N

B6M0244

C: TROUBLE CODE 11 — BRAKE SWITCH, STOP LIGHT SWITCH, CLUTCH SWITCH, INHIBITOR SWITCH —

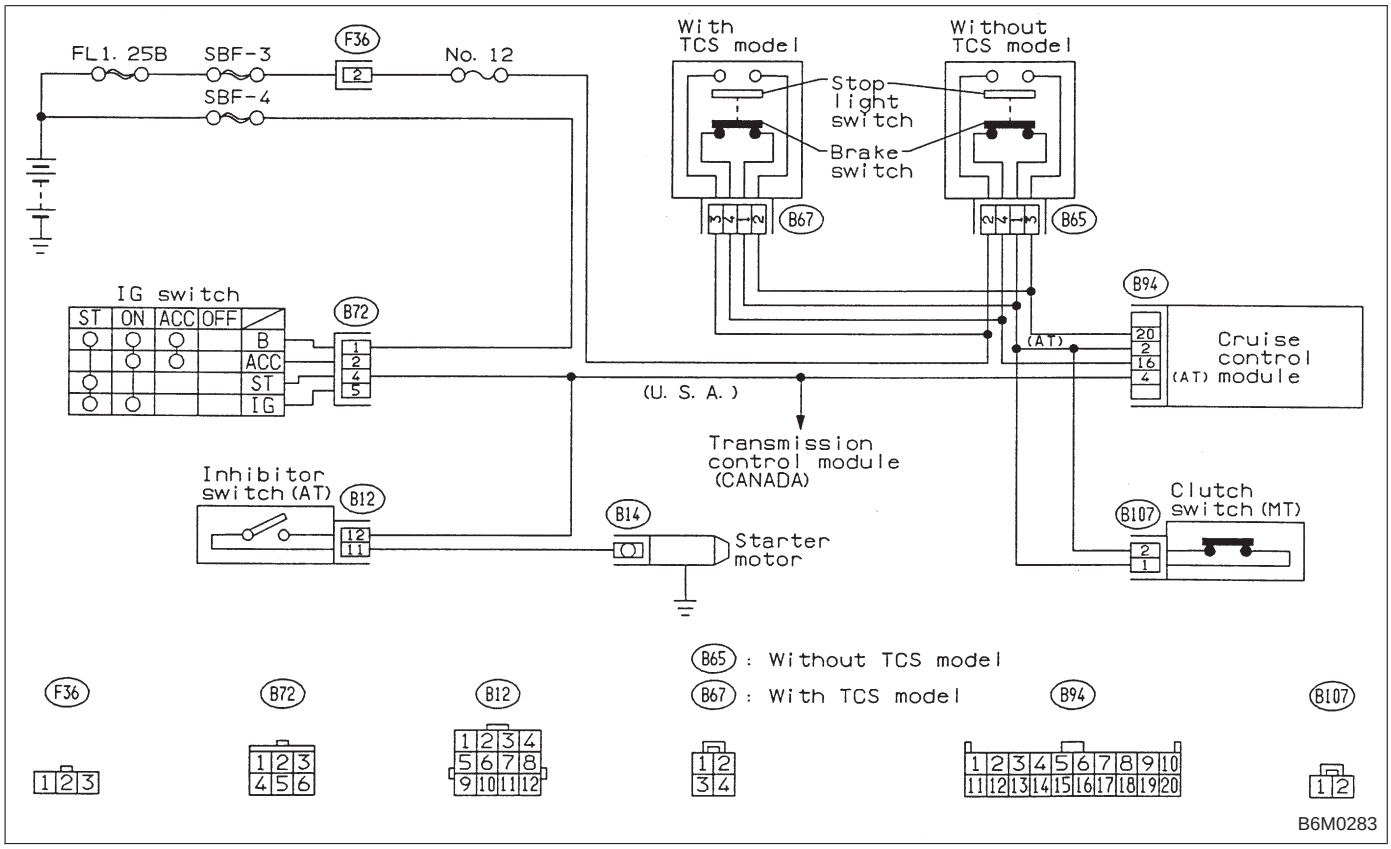
DIAGNOSIS:

- Failure or disconnection of the stop light switch and brake switch.
- Failure or disconnection of the inhibitor switch. (AT)
- Failure or disconnection of the clutch switch. (MT)

TROUBLE SYMPTOM:

- Cruise control cannot be set.

1. Check the signal using a select monitor.	OK →	Check for disconnection of the harnesses and connectors.
Not OK ↓		
2. Check brake switch and stop light switch.	Not OK →	Replace switch, repair wiring.
OK ↓		
3. Check clutch switch. (MT model)	Not OK →	Replace switch, repair wiring.
OK ↓		
4. Check inhibitor switch. (AT model)	Not OK →	Replace switch, repair wiring.
OK ↓		
	OK →	Failure of the cruise control module.



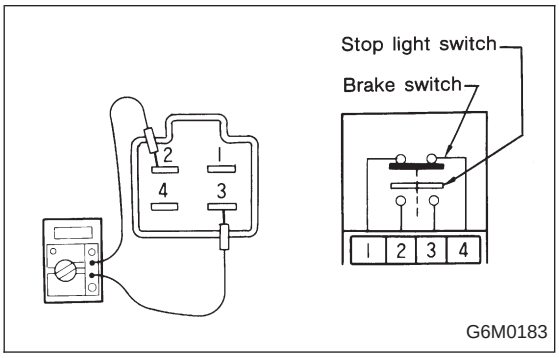
LED No.	Signal name	Display
1	SET/COAST switch	SE
2	RESUME/ACCEL switch	RE
3	Stop light switch	ST
4	● Brake switch ● Clutch switch (MT)	BR
5	Inhibitor switch (AT)	N
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—

SE	RE	ST	BR	N
—	—	—	—	—

1	2	3	4	5
6	7	8	9	10

1. CHECK THE SIGNAL USING A SELECT MONITOR.

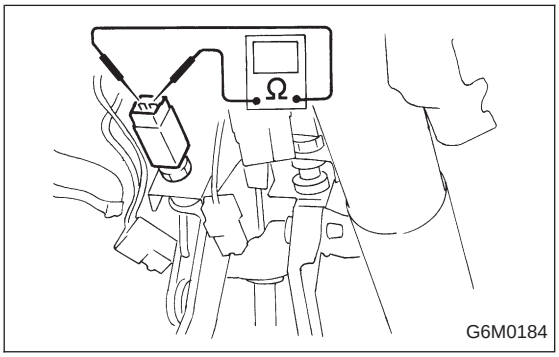
1) Turn ignition switch to ON.
2) Turn cruise control main switch to ON.
3) Apply parking brake securely.
4) Set select monitor in “FA0” mode.
5) Release the clutch pedal. (MT model)
6) Depress the brake pedal and check signals for proper operation.
   Stop light switch: LED No. 3 goes out — lights.
   Brake switch : LED No. 4 goes out — lights.
7) Release the brake pedal.
8) Depress the clutch pedal and check signal for proper operation. (MT model)
   Clutch switch: LED No. 4 goes out — lights.
9) Set the selector lever from D to N position and check signal for proper operation. (AT model)
   Inhibitor switch: LED No. 5 goes out — lights.



2. CHECK BRAKE SWITCH AND STOP LIGHT SWITCH.

1) Remove connector of stop and brake switch.
2) Check circuit between each terminal.

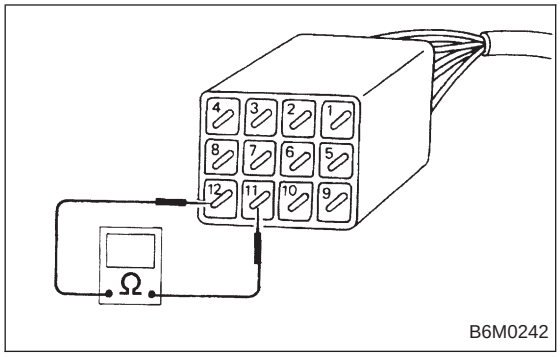
Pedal operation	Brake switch between No. 1 — No. 4	Stop light switch between No. 2 — No. 3
Depressing the brake pedal.	1 MΩ, or more	1 Ω, or less
Without depressing the brake pedal.	1 Ω, or less	1 MΩ, or more



3. CHECK CLUTCH SWITCH. (MT MODEL)

1) Disconnect connector from clutch switch.
2) Check continuity of the clutch switch.

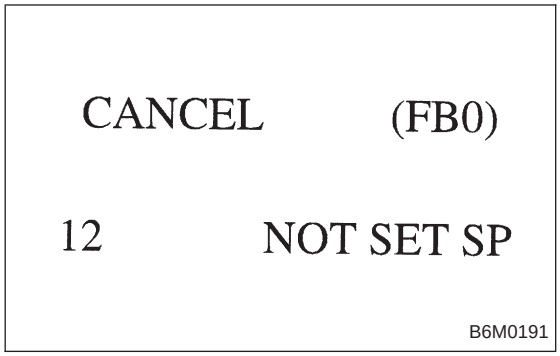
Terminals / Specified resistance:
No. 1 — No. 2 / 10 Ω, max. (Without pedal depressing.)
/ 1 MΩ, min. (Pedal depressing.)



4. CHECK INHIBITOR SWITCH. (AT MODEL)

1) Set the selector lever to N position.
2) Disconnect connector of inhibitor switch.
3) Check continuity of the inhibitor switch.

Terminals / Specified resistance:
No. 11 — No. 12 / 10 Ω, max.
(Selector lever is in P or N.)
/ 1 MΩ, min.
(Selector lever is not in P or N.)



D: TROUBLE CODE 12, 13 AND 21 — VEHICLE SPEED SENSOR 2 SYSTEM —

DIAGNOSIS:

● Disconnection or short circuit of vehicle speed sensor 2 system.

TROUBLE SYMPTOM:

● Cruise control cannot be set. (Cancelled immediately.)

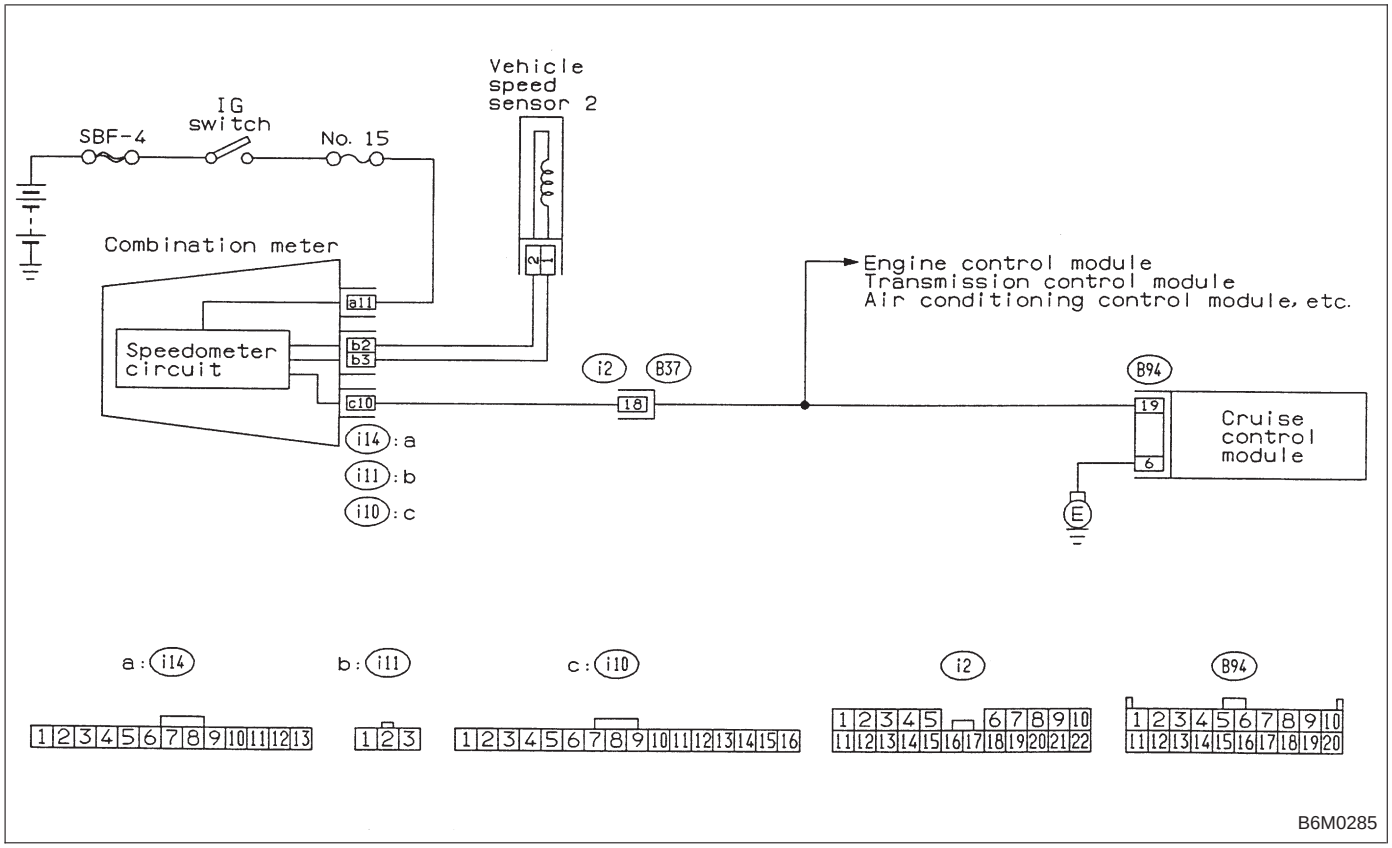
1. Check operation of speedometer.
- Not OK → Check combination meter circuit. <Ref. to 6-2 [K3A0] in REPAIR SECTION.>
- OK ↓

2. Check input signal for cruise control module.
- OK → ● Check for disconnection of the cruise control module connector terminal. ● Failure of the cruise control module.
- Not OK ↓

3. Perform a circuit test between combination meter and cruise control module.
- Not OK → Repair or replace harness connector.
- OK ↓

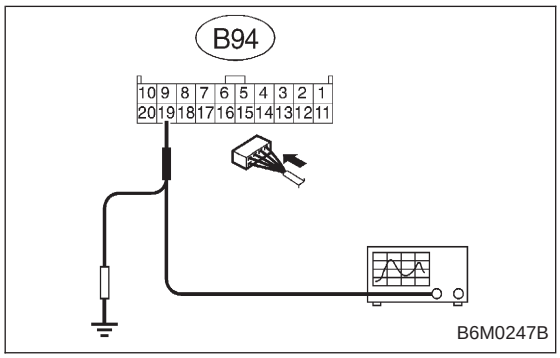
4. Check vehicle speed sensor 2.
- Not OK → ● Mechanical trouble between vehicle speed sensor 2 and speedometer shaft in transmission. ● Failure of the vehicle speed sensor 2. → Replace vehicle speed sensor 2.
- OK ↓

Failure in combination meter circuit.



1. CHECK OPERATION OF SPEEDOMETER.

Make sure that speedometer indicates the vehicle speed by driving the vehicle.

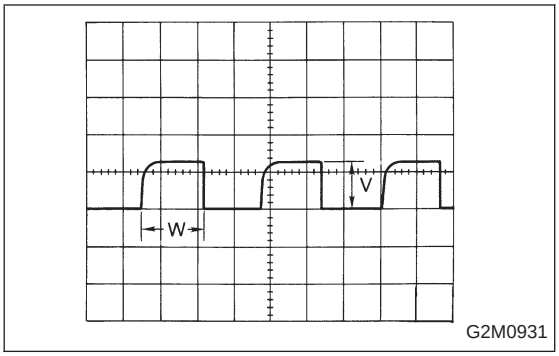


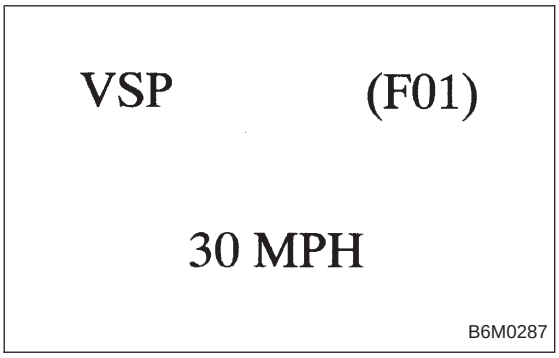
2. CHECK INPUT SIGNAL FOR CRUISE CONTROL MODULE.

WARNING:
Be careful not to be caught up by the running wheels.

1) Set the vehicle on free roller, or lift-up the vehicle and support with safety stands.
2) Set oscilloscope to cruise control module connector terminals.

Connector & terminal / (B94) No. 19 — Body



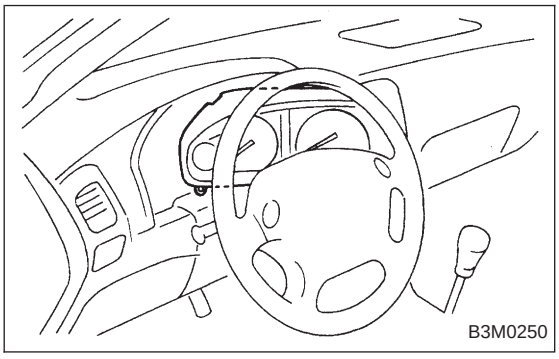


3) Start the engine.
4) Shift on the gear position, and keep the vehicle speed at constant.
5) Measure signal voltage.

Specified voltage (V): 2 V, or more

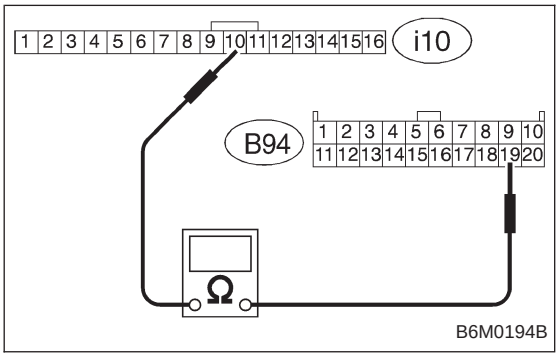
NOTE:
● If the vehicle speed increases, the width of amplitude (W) decreases.
● If oscilloscope is not available, check input signal (vehicle speed signal) by using a select monitor. (Refer to the procedure as described below.)
● Using the select monitor:
(1) Set the vehicle on free roller, or lift-up the vehicle and support with safety stands.
(2) Turn ignition switch to OFF and set select monitor.
(3) Turn ignition switch to ON.
(4) Turn cruise control main switch to ON.
(5) Set select monitor in “F01” or “F02” mode.
(6) Drive the vehicle at speed greater than 40 km/h (25 MPH).
(7) Check that vehicle speed indication on select monitor and speedometer are equal.

NOTE:
● When there is a disconnection or short circuit in the harness between the meter and the cruise control module, the indicated value will be 0 to 1.0 km/h (0 to 0.6 MPH).
● In “F01” mode, vehicle speed is indicated in mile per hour (MPH).
In “F02” mode, vehicle speed is indicated in kilometer per hour (km/h).



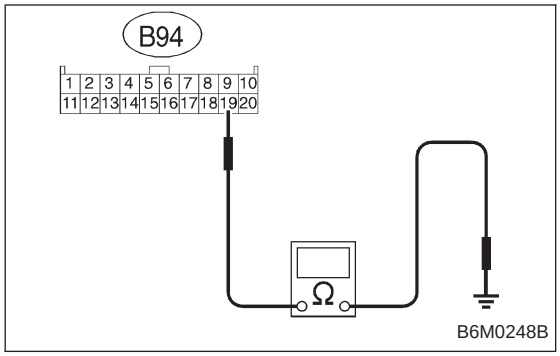
3. PERFORM A CIRCUIT TEST BETWEEN COMBINATION METER AND CRUISE CONTROL MODULE.

1) Turn ignition switch to OFF.
2) Remove combination meter.



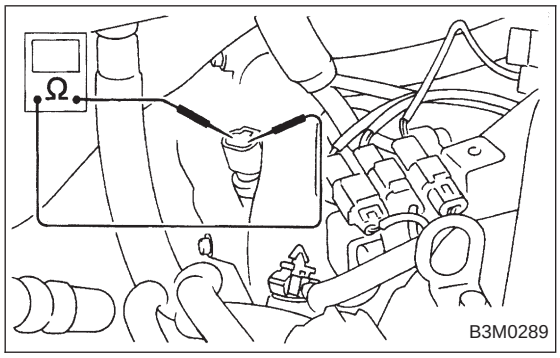
3) Disconnect connector from cruise control module.
4) Measure resistance of harness connector between combination meter and cruise control module.

Connector & terminal / Specified resistance:
(i10) No. 10 — (B94) No. 19 / 10 Ω, max.



5) Measure resistance of harness connector between cruise control module and body to make sure that circuit does not short.

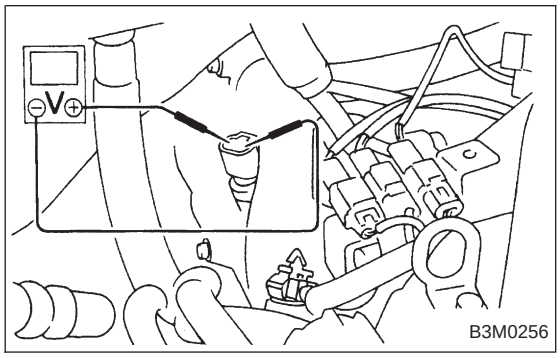
Connector & terminal / Specified resistance:
(B94) No. 19 — Body / 1 MΩ, min.



4. CHECK VEHICLE SPEED SENSOR 2.

1) Disconnect connector from vehicle speed sensor 2.
2) Measure resistance between terminals of vehicle speed sensor 2.

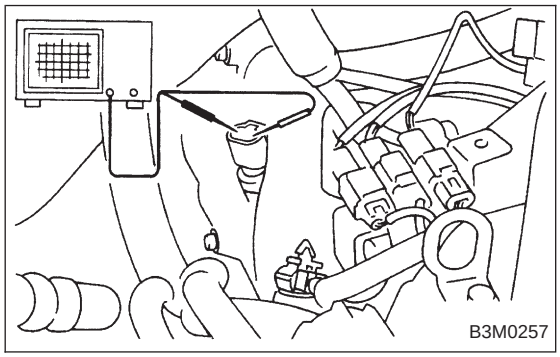
Terminals / Specified resistance:
No. 1 — No. 2 / 350 — 450 Ω



WARNING:
Be careful not to be caught up by the running wheels.

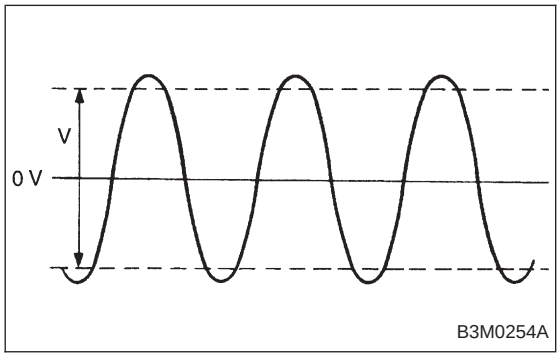
3) Set the vehicle on free roller, or lift-up the vehicle and support with safety stands.
4) Drive the vehicle at speed greater than 20 km/h (12 MPH).
5) Measure voltage between terminals of vehicle speed sensor 2.

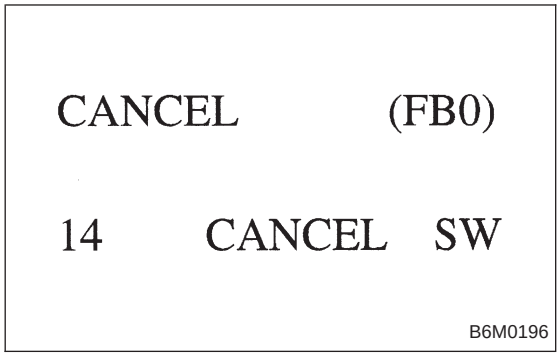
Terminals / Specified voltage:
No. 1 — No. 2 / 2 V, or more (AC range)



- Using an oscilloscope:
  (1) Turn ignition switch to OFF.
  (2) Set oscilloscope to vehicle speed sensor 2.
  (3) Drive the vehicle at speed greater than 20 km/h (12 MPH).
  (4) Measure signal voltage.

Specified voltage (V): 5 V, min.





E: TROUBLE CODE 14 AND 22 — SET/COAST SWITCH, RESUME/ACCEL SWITCH, CANCEL SWITCH —

DIAGNOSIS:

- Short circuit inside the SET SW and RESUME SW.

TROUBLE SYMPTOM:

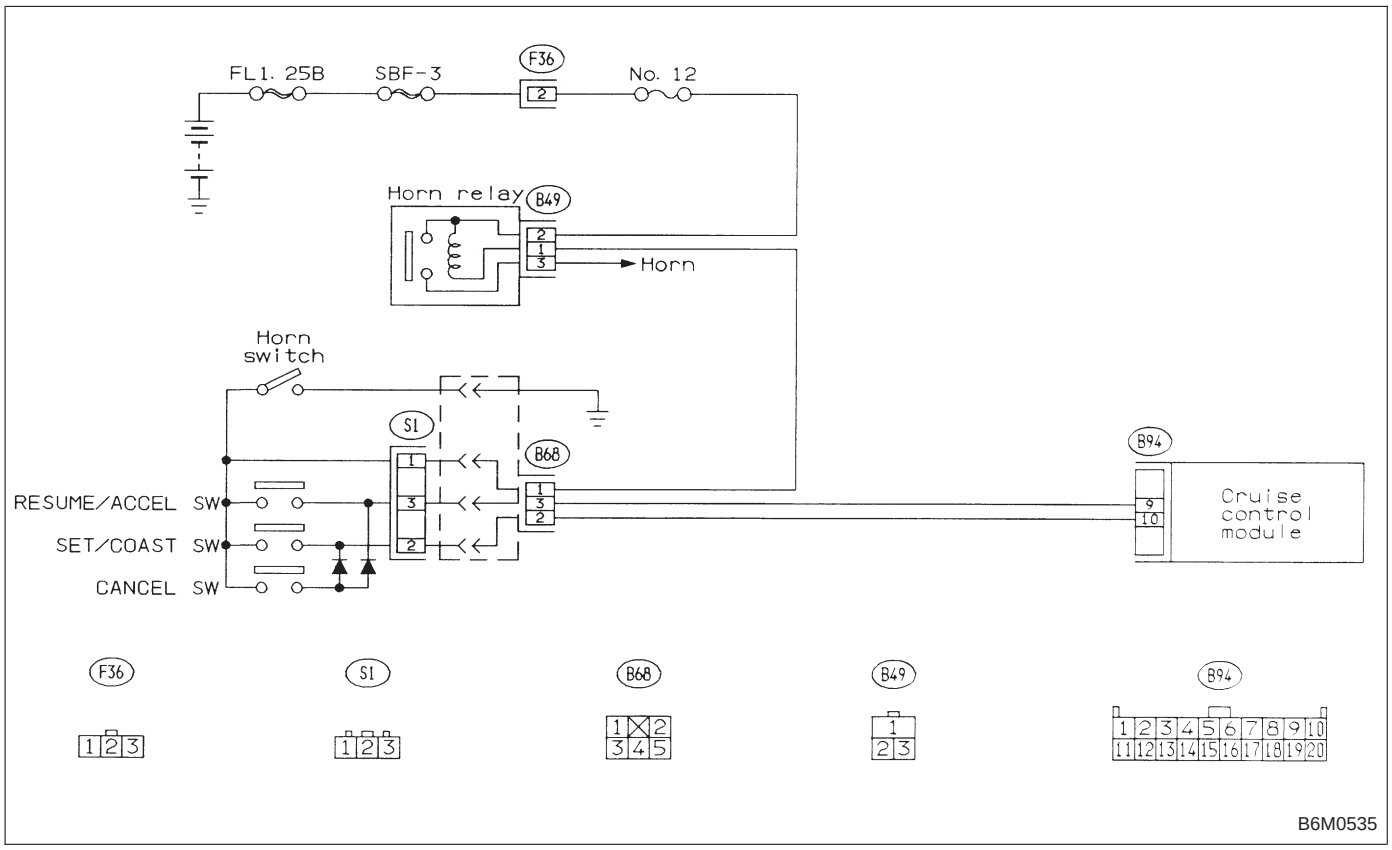
- Cruise control cannot be set. (Cancelled immediately.)

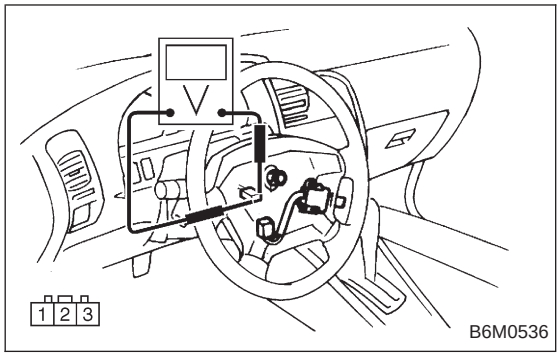
1. Check short circuit of cruise control command switch.

Not OK → Replace the command switch.

OK ↓

Check for short circuit in harness between command switch and cruise control module.



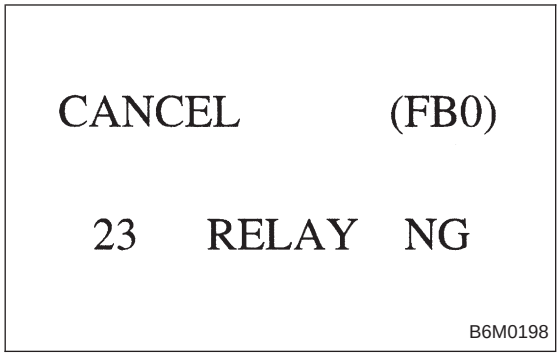


1. CHECK SHORT CIRCUIT OF CRUISE CONTROL COMMAND SWITCH.

1) Turn ignition switch to ON.
2) Measure voltage between each terminal of connector (S1).

Terminals / Specified resistance:

SET switch ON
(S1) No. 1 — (S1) No. 2 / 10 — 13 V
RESUME switch ON
(S1) No. 1 — (S1) No. 3 / 10 — 13 V
CANCEL switch ON
(S1) No. 1 — (S1) No. 2 / 10 — 13 V
(S1) No. 1 — (S1) No. 3 / 10 — 13 V



F: TROUBLE CODE 23 AND 24 — CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM —

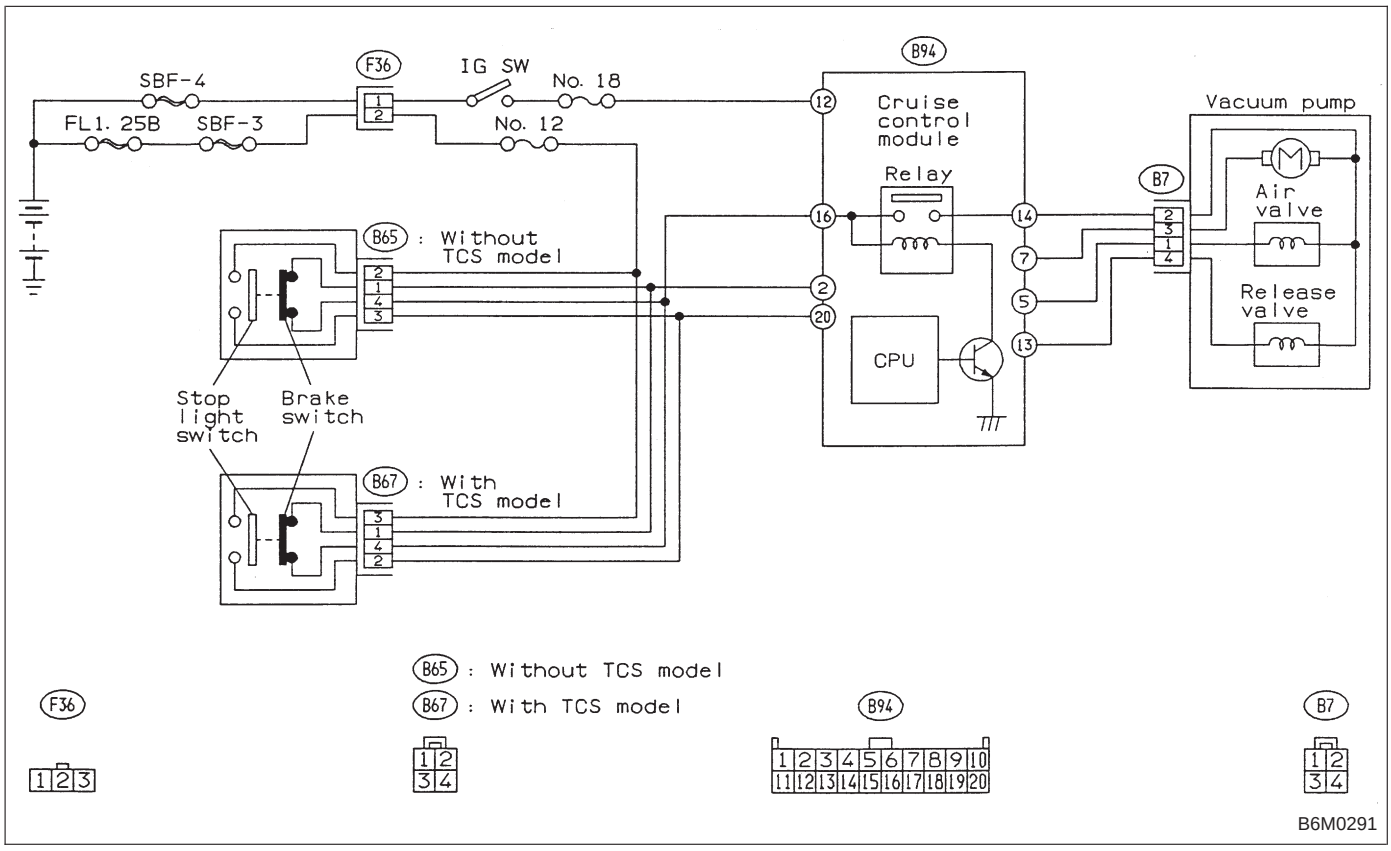
DIAGNOSIS:

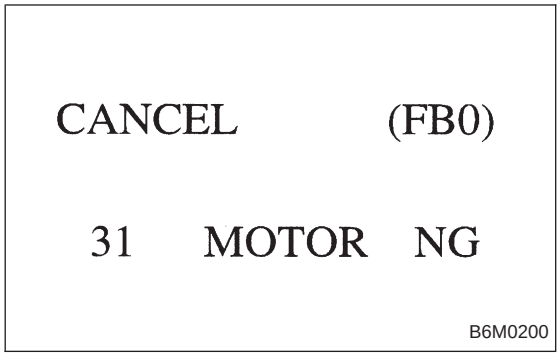
- Welding of built-in relay of cruise control module.
- Failure of built-in CPU RAM of cruise control module.

TROUBLE SYMPTOM:

- Cruise control is cancelled and memorized cruise speed is also cancelled.
- Once cruise control is cancelled, cruise control cannot be set until the ignition switch and cruise main switch turns OFF, and then turns ON again.

NOTE:
Perform real-time diagnosis (“FA0” mode) and check vehicle speed signal with select monitor.
When input signals are in good condition, failure is in cruise control module.
(Check power supply and ground condition of cruise control module.)





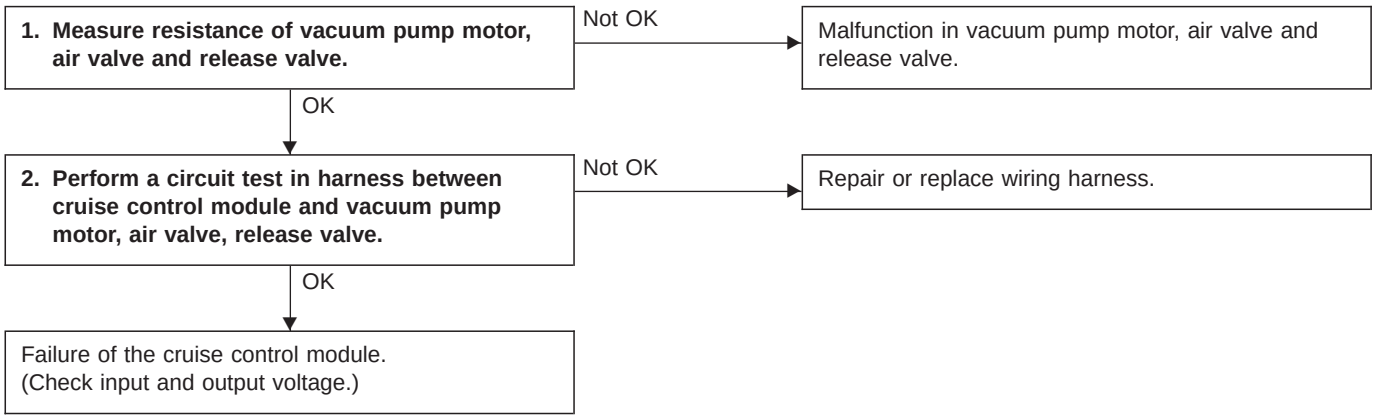
G: TROUBLE CODE 31, 32 AND 33 — VACUUM PUMP, AIR VALVE, RELEASE VALVE —

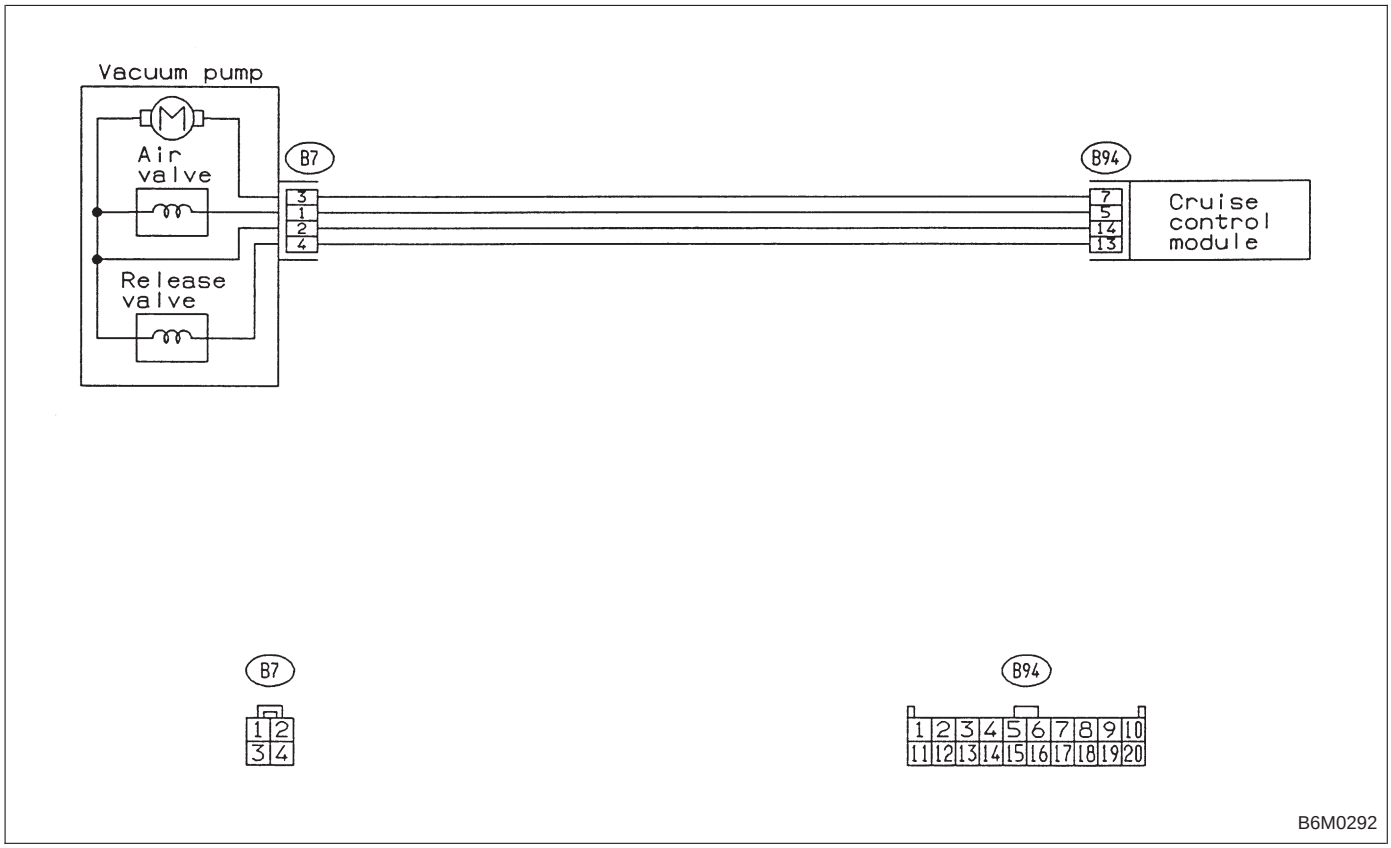
DIAGNOSIS:

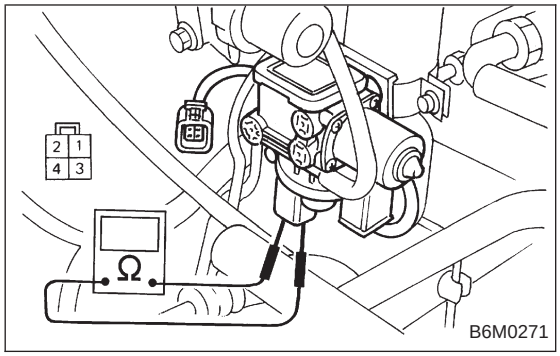
- Open or poor contact of vacuum pump motor, air valve and release valve.

TROUBLE SYMPTOM:

- Cruise control cannot be set. (Cancelled immediately.)



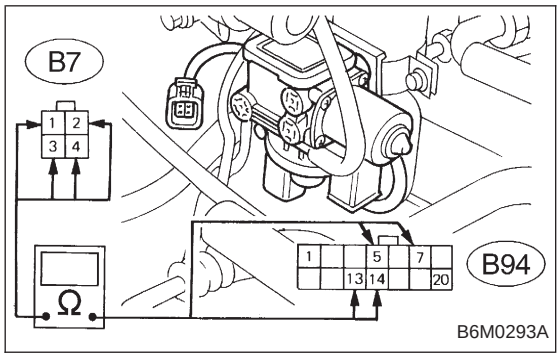




1. MEASURE RESISTANCE OF VACUUM PUMP MOTOR, AIR VALVE AND RELEASE VALVE.

1) Disconnect connector of vacuum pump and valve.
2) Measure resistance of vacuum pump motor, air valve and release valve.

Terminals / Specified resistance:
No. 2 — No. 3 / 46 Ω (Vacuum pump motor)
No. 2 — No. 1 / 69 Ω (Air valve)
No. 2 — No. 4 / 69 Ω (Release valve)



2. PERFORM A CIRCUIT TEST IN HARNESS BETWEEN CRUISE CONTROL MODULE AND VACUUM PUMP MOTOR, AIR VALVE, RELEASE VALVE.

1) Disconnect connectors from cruise control module, vacuum pump and valve.
2) Measure resistance of harness connector between cruise control module, vacuum pump motor, air valve and release valve.

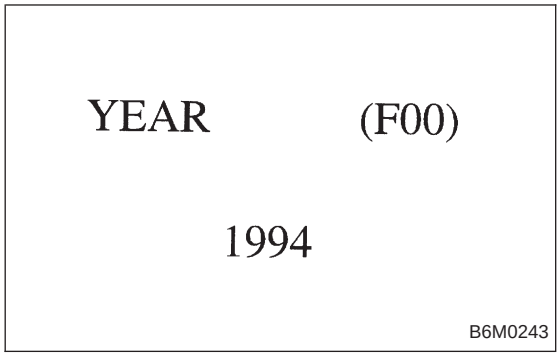
Connector & terminal / Specified resistance:
(B7) No. 1 — (B94) No. 5 / 10 Ω, max.
(B7) No. 2 — (B94) No. 14 / 10 Ω, max.
(B7) No. 3 — (B94) No. 7 / 10 Ω, max.
(B7) No. 4 — (B94) No. 13 / 10 Ω, max.

9. Diagnostics Chart with Select Monitor

A: FUNCTION MODE

Applicable cartridge of select monitor: No. 498349601

Function mode	Contents	Abbreviation	Unit of measure	Page
F00	ROM ID number	YEAR	—	33
F01	Vehicle speed signal	VSP	MPH	33
F02	Vehicle speed signal	VSP	km/h	33
F03	Memorized cruise set speed	MSP	MPH	34
F04	Memorized cruise set speed	MSP	km/h	34
FA0	ON ↔ OFF signal	—	—	35



B: MODE F00 — ROM ID NUMBER (YEAR) —

CONDITION:

Ignition switch “ON”

SPECIFIED DATA:

Presentation display

- Probable cause (Item outside “specified data”)

1. Error 1	Check for loose or disconnected connector, and discontinued circuit, etc.
2. Error 2	Check for poor contact of cartridge, or different type cartridge.

C: MODE F01 AND F02 — VEHICLE SPEED SIGNAL (VSP) —

CONDITION:

Driving at constant speed.

SPECIFIED DATA:

Compare speedometer with monitor indications.

- F01: Vehicle speed is indicated in mile per hour (MPH).
- F02: Vehicle speed is indicated in kilometer per hour (km/h).

- Probable cause (Item outside “specified data”)

1. Vehicle speed sensor 2	Check vehicle speed sensor line. <Ref. to 6-2 [T8D0].>

D: MODE F03 AND F04 — MEMORIZED CRUISE SET SPEED (MSP) —

CONDITION:

Driving at minimum of 40 km/h (25 MPH) and set cruise control.

SPECIFIED DATA:

Compare displayed vehicle speed on select monitor in mode “F03” and “F04” with the speed in mode “F01” and “F02”.

- F03: Memorized cruise set speed is indicated in mile per hour (MPH).
- F04: Memorized cruise set speed is indicated in kilometer per hour (km/h).

NOTE:

- F01: Actual vehicle speed is indicated in mile per hour (MPH).
- F02: Actual vehicle speed is indicated in kilometer per hour (km/h).

- Probable cause (Item outside “specified data”)

1. Cruise control module	Check cruise control module input/output signals.
2. Cruise control command switch	Check cruise control command switch.

LED No.	Signal name	Display
1	SET/COAST switch	SE
2	RESUME/ACCEL switch	RE
3	Stop light switch	ST
4	● Brake switch ● Clutch switch (MT)	BR
5	Inhibitor switch (AT)	N
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—

SE	RE	ST	BR	N
—	—	—	—	—

1	2	3	4	5
6	7	8	9	10

E: MODE FA0
— ON ↔ OFF SIGNAL —

Requirement for LED “ON”.
LED No. 1 SET/COAST switch is turned to ON.
LED No. 2 RESUME/ACCEL switch is turned to ON.
LED No. 3 Stop light switch is turned to ON.
(Brake pedal is depressed.)
LED No. 4 ● Brake switch is turned to ON.
● Clutch switch is turned to ON. (MT model)
(Clutch pedal is depressed.)
LED No. 5 Select lever is set to “P” or “N” position. (AT model)